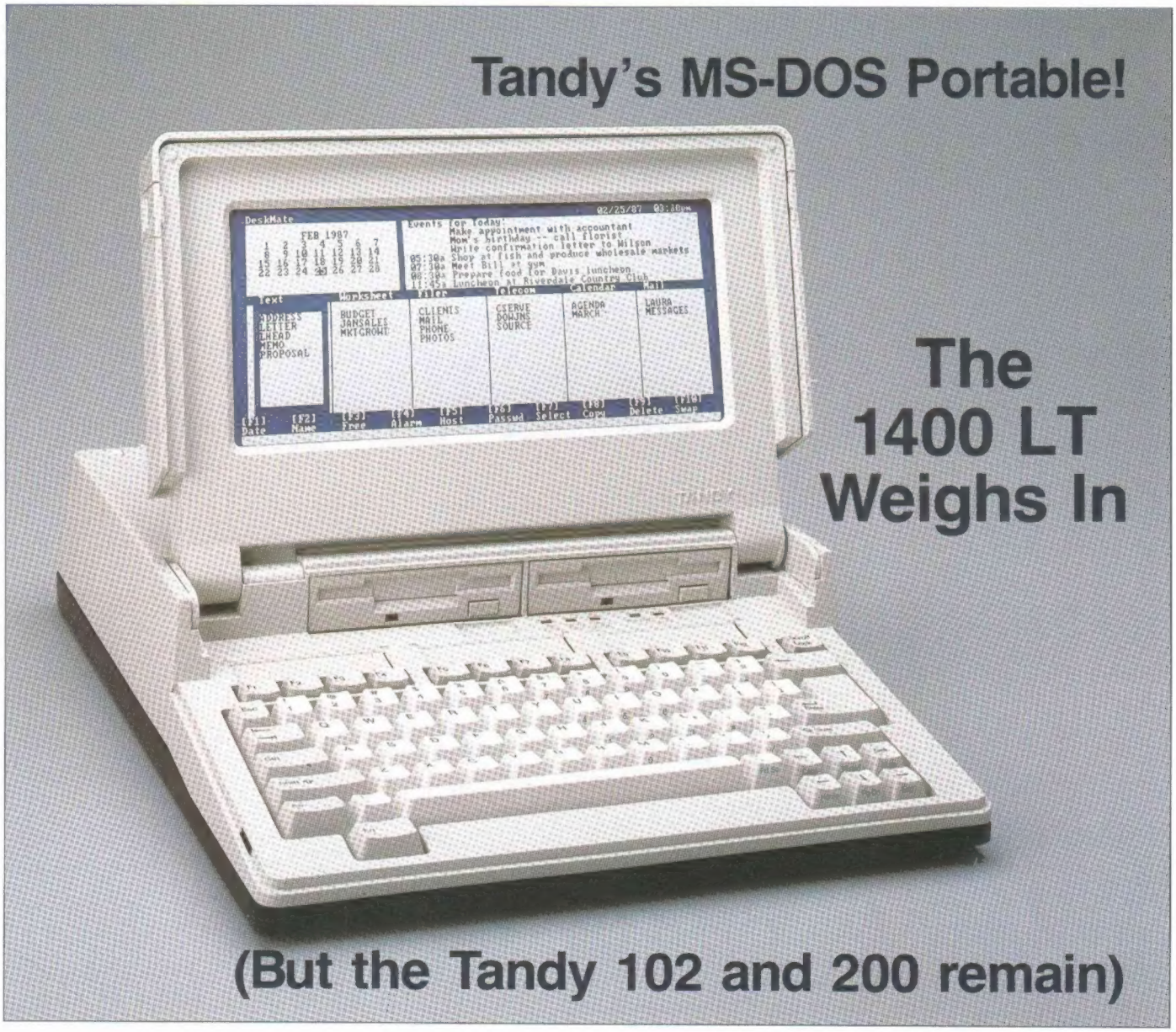
An IDG Communications Publication $3.95/CAN $4.95

portable 100

TANDY LAPTOP COMPUTING VOLUME 4 NUMBER 3 OCTOBER 1987

Tandy's MS-DOS Portable!



The 1400 LT Weighs In

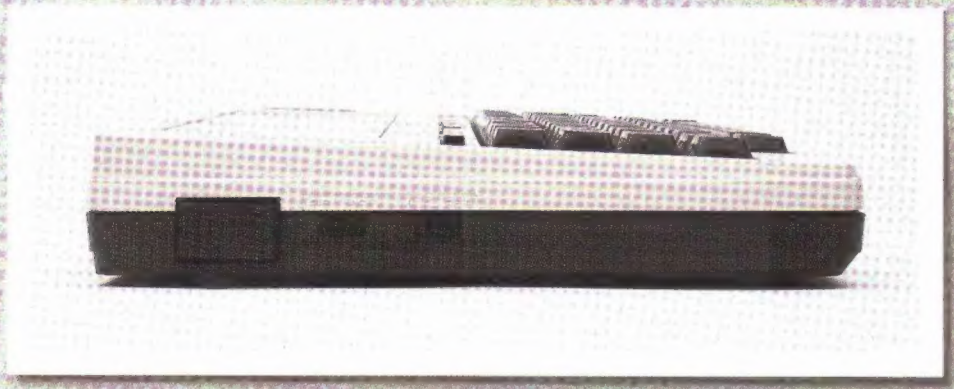
(But the Tandy 102 and 200 remain)

ALSO THIS ISSUE:

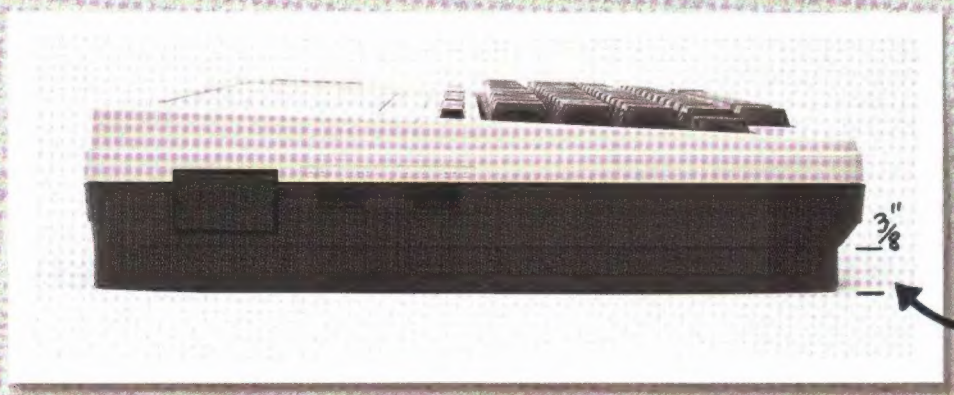
PRINTER ALTERNATIVES
BUILD A SPIKE PROTECTOR
ULTRASCREEN
DISK OPERATING SYSTEMS

PLUS: More programming tips and software utilities!

Find the memory in these pictures.



Stock Tandy 102 with 24K of memory.



Tandy 102 with 1 megabyte of RAM Vault memory by P.G. Design.

IF YOU NEED MORE MEMORY, YOU NEED THE VAULT!

The Vault adds as much as 1 megabyte of continuous RAM memory to the Tandy 102. With the Vault, you can maintain as many as 256 separate menu files (not just 19). It comes with four ROM sockets: 2 standard, 2 Radio Shack compatible. Adding only 3/8 inch of thickness, the Vault attaches firmly and easily with four screws.

For pricing information and technical questions, call us today!

313/727-2744

Circle 43 on Reader Service Card

PG DESIGN ELECTRONICS, INC.

37560 Thirty-one Mile Road, Richmond, MI 48062

Copyright 1987 by P.G. Design Electronics, Incorporated. Tandy is a registered trademark of Radio Shack, a Tandy Corporation.

SAVE 48% RIGHT NOW!

"I have found something in almost every issue that has been worth the price of the subscription. I am amazed at the broad spectrum of the technical articles you publish, with ample material for both novice and advanced programmer."

Roger L. *Holstege*. . . MD

And with 6 to 12 new programs for your Tandy computer in every issue, you too will find something each month that's worth the low cost of your subscription! Just type them in, and they're yours. Spreadsheets, word processors, all kinds of home, business and personal applications, plus helpful **utilities** that make all your programs easier to write, debug and use.

Valuable Hardware Projects

Want more value? How about *80 Micro*'s money saving **hardware projects** you build yourself. . . or our frequent **patches and enhancements** that make commercial software programs even better.

Programming Techniques & Tutorials

You'll add to the value of your computer and get more out of every hour you spend computing with expert guidance from *80 Micro*'s **programming techniques** that help you streamline and improve programs. In addition, *80 Micro*'s step-by-step **tutorials** keep you ahead of today's fast-moving technologies like nothing else.

Hardware & Software Reviews

Avoid even one chancey hardware purchase, and you've saved enough to repay years of *80 Micro* subscriptions! You'll save yourself a bunch of time and hassle, too, with *80 Micro* checking out new software for you. Zero in on programs and products you want and skip the clunkers.

► For even quicker service, ☎ **CALL TOLL FREE 1-800-258-5473** (in NH, dial 1-924-9471) and charge it to your credit card!

The Most Widely Read Magazine In Its Field

80 Micro is the most widely read magazine serving Tandy users today, with the largest editorial staff in its field. It's the oldest and most authoritative, too, so you know you can trust the help and advice you find in every issue.

Start Saving Now With 48% Off The Cover Price!

Yes it's true. You don't even have to wait for your first issue to start saving with *80 Micro*! Just use the coupon below or return the postpaid card opposite and you'll start receiving *80 Micro* every month at a full **48% off** the Newsstand Rate. ***If you're ever dissatisfied, for any reason, you'll be reimbursed for all un-delivered issues. Guaranteed!*** So do it now. And get *80 Micro*'s value working for you, *every* month from now on!

* TRS-80 is a trademark of Radio Shack, a division of Tandy Corp.

YES, I want to add the value of *80 Micro* every issue. Enter my no-risk subscription for 12 monthly issues at the Introductory Rate of just $24.97! I save a full **48% off** the newsstand price!

☐ Payment enclosed ☐ Bill me

Name (Please Print)

Address

City State Zip

Canada $45.97 (Canadian Funds), Mexico $29.97, Foreign Surface $44.97 (US Funds drawn on US Bank). All rates are 1 year only. Foreign Airmail, please inquire. Please allow 6–8 weeks for delivery. 37AB4

80 Micro • Box 981 • Farmingdale, NY 11737

portable 100

VOL. 4, NO. 3 OCTOBER 1987

ON THE COVER

TANDY'S NEW DANDY
by Roger Strukhoff & Alan L. Zeichick . . . 8
A first look at Tandy's big plunge into the MS-DOS pool.

FEATURES

BORN TO COMMUNICATE
by Alan L. Zeichick 12
What your laptop needs to talk to the big boys.

BUILD YOUR OWN SPIKE PROTECTOR
by Mike White 17
Save your laptop from a shocking experience..

TELECOMMUNICATING WITH YOUR TANDY 600 by Carl Oppedahl 21
Although Tandy tried, TELCOM 600 is just more complicated.

WATCHING THE BIG SCREEN by Alan L. Zeichick 24
With these products, smaller is really bigger.

DISK OPERATING SYSTEMS FOR THE MODEL 100 by Thomas L. Quindry 28
There are a number of good alternatives to FLOPPY.CO.

UTILITY CORNER by Terry Sargent 34
This month: tuning guitars and counting words.

THE PRINTS AND THE PAUPER by Alan L. Zeichick 36
With SPRINT, you can print whatever your heart desires.

WEIGHING THE PRINTER ALTERNATIVES by Alan L. Zeichick 40
Does having a handle make it portable?

DEPARTMENTS

ROM WITH A VIEW 3
I/O 4
MAXRAM 46

Cover Photograph courtesy of Tandy Corp.

Editor
Roger Strukhoff
(603) 924-9471

Managing Editor
Steven F. Smith

Technical Editor
Alan L. Zeichick

Assistant Editor
Janet M. Tiampo

Senior Contributing Editor
Carl Oppedahl

Contributing Editors
Thomas L. Quindry
Terry Sargent
Mike White

Art Director
Lou Ann Morin

Design Consultant
Peter D. Koons
High Resolution

Publisher
Jeff DeTray

Associate Publisher
Jim McBrian
(603) 924-9471

Advertising Coordinator
Michelle Boot

Corporate Production Director
Dennis Christensen

Manufacturing Manager
Susan Gross

Assistant Manufacturing Manager
Leslie Walden

President/CEO
Michael S. Perlis

Vice President/Finance
Roger Murphy

Director of Circulation
Frank S. Smith

Circulation Manager
Bonnie Welsh

Single Copy Sales Manager
Linda Ruth

Direct Marketing Manager
Paul Reuss

Telemarketing Manager
Elizabeth R. Kehn

Director of Credit Sales
William M. Boyer

ISSN 0893-942X

Portable 100 is an independent journal not connected with any hardware, software, or peripheral equipment manufacturer. Portable 100 is published by CW Communications/ Peterborough, Inc., 80 Elm St., Peterborough, NH 03458. Second Class postage paid at Peterborough, NH and additional mailing offices. Subscription rates in the U.S. are $24.97 for 12 issues. In Canada $45.97 (Canadian). In Mexico, $29.97, U.S. funds drawn on a U.S. bank. Other foreign subscriptions (surface mail) are $44.97 for 12 issues; air mail is $79.97, U.S. funds drawn on a U.S. bank. Address all subscription correspondence to Portable 100, Subscription Dept., 80 Elm St., Peterborough, NH 03458. POSTMASTER: Send address changes to Portable 100, 80 Elm St., Peterborough, NH 03458. *Entire contents of this issue copyright 1987 by CW Communications/ Peterborough, Inc. No part of this publication may be printed or otherwise reproduced without written permission from the publisher.* *Portable 100 makes every effort to assure the accuracy of articles published in the magazine. Portable 100 assumes no responsibility for damages due to errors or omissions. Volume 4, Number 3, October, 1987.*

ROM WITH A VIEW

The M Word

Tandy for years resisted the laptop, MS-DOS computer market. While companies like IBM, Hewlett-Packard and Data General invested — and often lost — lots of money trying to come up with the right formula, Fort Worth stuck to its Model 100 guns. When it did finally offer an expensive portable, the result was the 600, an unfortunate choice that has not received the third-party support critical to the success of other Tandy laptops.

Now there's the 1400 LT, announced August 3 at Tandy's 10-year anniversary soiree in New York. (That's 10 years in the computer business; the company's been around most of this century.) Tandy's patience may pay off. The 1400 appears to be among the best of today's MS-DOS laptop computers. Its combination of features and low price may be successful in a tough market.

That market may in fact not be that tough anymore. Protectionist tariffs have hurt some Japanese systems like the NEC Multispeed and Toshiba 3100, and Toshiba is in even deeper trouble because of one of its subsidiary's sale of military technology to the Soviet Union.

On the other hand, that market may be that tough anyway. NEC has started building Multispeeds in Georgia, and at press time, a number of U.S. companies, including Apple Computer, were lobbying for Toshiba. Besides, for all the Made In America rhetoric from Tandy, the 1400 LT is made in Japan, too.

Whether or not Model 100 and Tandy 102 and 200 owners will buy the 1400 LT is not a concern of Tandy's. The company does not see those owners as its prime market. We at *Portable 100* want to know whether Tandy's correct. Look for the article about the 1400 LT in this issue for a little survey.

Meanwhile, Tandy does not plan to abandon its loyal customers, so it says. The 600 is history, of course, although it's still being offered in the 1988 Tandy catalog. But the 102 and 200 will stay on, and continue to be supported by a number of third-party developers.

The response we've received from the first two issues of *Portable 100* has been overwhelming. Readers are thrilled to have their magazine back, and are looking forward to many hours happy reading and programming. We've also received a number of suggestions — about programs, establishing a bulletin board system (BBS), file transfers to MS-DOS, to mention three. Keep the comments coming. An active readership makes a magazine work.

Now on to the next issue...

Roger Strukhoff, Editor

It's Great to Be Back

In your ROM with a View column you asked me to let you know what I think about the new *Portable 100*. For what it's worth here it is: It's great to have *Portable 100* back and I find the overall quality of the issue excellent. Congratulations!

K.W. Klages
Orlando, Fla.

I hardly could believe my eyes when the mail came yesterday. Just the other day I was lamenting the loss of *Portable 100*, while searching my newsstand in vain for a magazine with articles for the Model 100 computer family. If only someone could publish a magazine as good as *Portable 100*, I thought to myself.

Golly gee whiz! My wishes have been answered. I am looking forward to every new issue....

I also have a suggestion. At one time, *Portable 100* planned to develop an operating system for the Tandy Portable Disk Drive. I would like to see such a program published. Now that the 100K drive is obsolete, I don't think you could harm the efforts of the second source vendors very much by doing so.

Leave out the bells and whistles. My only real objection to FLOPPY.CO is that it is not compatible with other machine-code programs. Being able to access the disk drive from other programs is a nice feature, but I would be willing to do without it in exchange for a compatible disk drive program.

Good luck with your new magazine acquisition.

Gerhard Watzig
Portland, Ore.

At the present time, considering the number — and high quality — of Portable Disk Drive operating systems, we have no plans to offer our own program. Look for a comparative review of current DOS offerings on page 28 of this issue. —*Ed.*

It's great to have you back...

Lee Levitt
New York

MAN AND MACHINE NOT TALKING
'TIL ONE OR THE OTHER APOLOGIZES.

I was pleasantly surprised to find a copy of *Portable 100* magazine waiting for me in my mailbox the other day. I am very happy that CW Communications took over the magazine, for I have missed it and eagerly look forward to future issues.

Warren O. Berry
St. Louis

It's good to see *Portable 100* back in action....

Arlen P. Walker
Milwaukee

I'm pleased to see *Portable 100* out, bearing my article on the Datamite. I've had five phone orders for parts and software in the first three days after publication, so I'm feeling optimistic about the response.

I discovered an error in the program which doesn't actually affect its functioning, but does prevent the program from clearing memory to accommodate the machine language frequency counter. The frequency counter gets poked if the user hadn't cleared some RAM manually, and data could be lost as a result. Here is the correction:

Line 80 as published read:

```
80 IF SV$="N" OR SV$="n" THEN 100
   ELSE 60
```

It should read:

```
80 IF SV$="N" OR SV$="n" THEN 90
   ELSE 60
```

My apologies for the error. I've been using the program for almost two years and just now discovered this problem by accident. (I am also including a note of correction in parts kits.)

By the way, the Datamite works with a Tandy 102 and should also work with a Tandy 200, with minor program modifications.

Here's to a bright future for *Portable 100*!

Kevin Jones
Lummi Island, Wash.

256K RAM FOR THE M102 & M100

Memory doesn't erase when you unplug it —
Buy multiple cartridges and carry them with you anywhere!

Instantly upgrade your Model 102 or your old Model 100 to 256K of RAM or use the budget unit for 160K. That little cartridge simply plugs onto the back of the Model 102. That's all there is to it. Buy several if you like, because they don't lose your files when you unplug them. (For the older type Model 100 we have a special shape that goes inside the little back compartment).

Like eight Model 102's in one.

You then have 8 banks of RAM of 32K each. The additional seven banks also work just like your Main Menu. Push a function key: you are in the second bank. Push again, the third and so forth until you are back to your original bank. Its built-in NiCad battery recharges right from the Model 102 and is guaranteed for a full year.

Copy a file from bank to bank with a function key.

Each bank is like having another Model 102. All the built-in programs and snap-in ROMs appear and work in all banks. Your widebar cursor moves from file to file and you just press ENTER.

Data files in excess of 220K.

You aren't limited to working with banks of 32K each. The ROM software included has extensions to BASIC that allow modification of programs to write and read data throughout the entire 256K. Data files can be created using all available memory, appearing to the user as one continuous 256K of RAM.

More features.

Rename or kill any file. Set the date, day and time with function key ease. Even use non-Radio Shack printers without those tricky dipswitch settings. Whenever you take out the snap-in ROM it leaves a tiny program that lets you switch banks just by pressing ENTER.

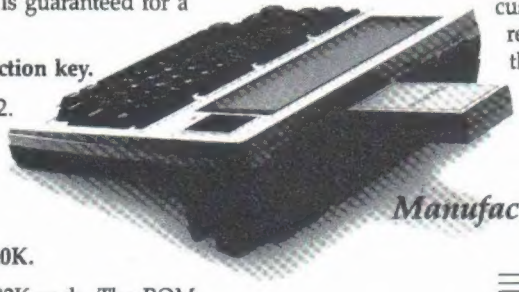
Total RAM*	128K	160K	256K
Model 100	$299	$369	$549
Model 102	—	$369	$549

*Including original 32K

The complete system.

The small center photo is the new 256K cartridge with the PCSG/Cryptronics 6 ROM bank, that allows six software ROMs installed, plus gives 30 hours of battery power to your computer. Combine that with SuperROM and the Holmes/PCSG portable disk drive (350K on a diskette): the complete portable system.

It is truly an engineering masterpiece. Thousands of PCSG/Cryptronics memory expansions have been shipped to satisfied customers — more are installed and working reliably than any competitive product. We sell these memory expansions on a 30-day trial. Simply return it within 30 days for a full refund if you are not satisfied.



Manufactured by Cryptronics, Inc.

PCSG

PERSONAL COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. #207 • Dallas, Texas 75229

214-351-0564

MasterCard VISA

Circle 71 on Reader Service Card

A big thank you to CW Communications for continuing *Portable 100* (and keeping the name simple!)

You would like to know what we think about the magazine? Here's my wish list:

1. When I owned a Commodore 64, the Model 100 became my primary computer, because with the Super-ROM chip installed I was able to much more. Now my Model 100 supplements a Zenith 158 desktop system. I am tempted to sell or give away my Model 100 and get an MS-DOS laptop so that I can use my favorite programs.

Could you publish articles on using the Model 100 as an extension of the desktop? I realize that things such as an Model 100 version of WordPerfect and SuperCalc should be left to software developers, but how about articles on transferring data files from the Model 100 to desktop computers? Sure, it is possible to transfer a WriteROM file, but isn't there a better way to make the formatting changes other than search-and-replace once the file has been transferred? Would you consider publishing an MS-DOS program to effect the changes?

2. I gather that it is possible to replace the Model 100's ROM chip. Is there anybody doing this?

3. Is it possible to program in Pascal on the Model 100 instead of BASIC?

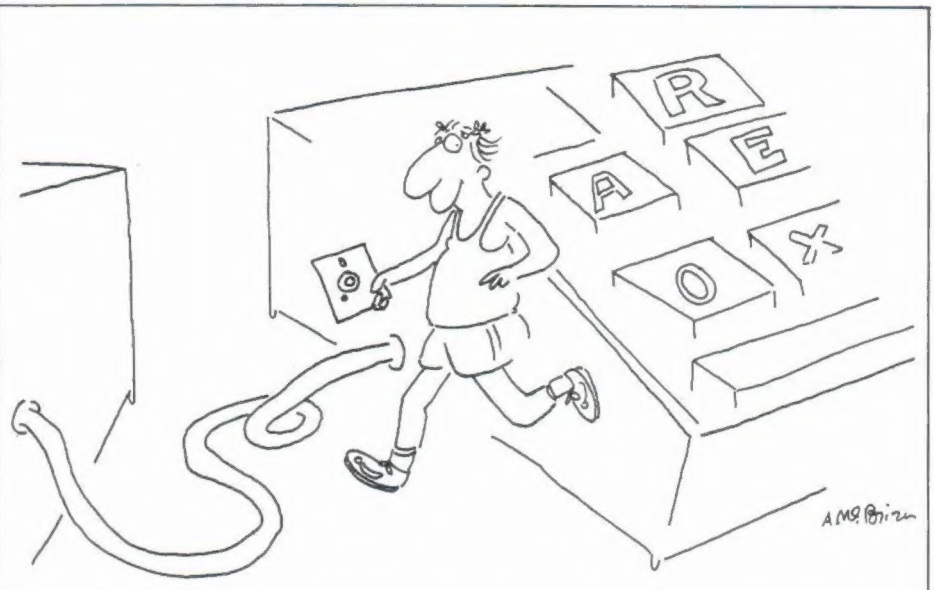
Thanks for listening to the desires of my heart.

Mark B. Regazzi
Berrien Springs, Mich.

To MS-DOS or not to MS-DOS... that's the question. We'd like your input, so please participate in the survey after our cover story about the Tandy 1400 LT, page 8. We enjoy articles regarding data communications and file transfers; we invite readers to share their tales of both success and failure through articles and letters.

It's certainly possible to replace the Model 100's operating-system ROM with a custom chip, as Senior Contributing Editor Carl Oppedahl explained in ROM It Yourself, *on page 32 of the August 1987 issue. We don't know of anyone using a Model 100 so modified, however.*

Your main programming options for the Model 100 are BASIC and assembler. However, you could program in Pascal on a larger computer, and compile the completed program using an 80C85 cross-compiler. It's a round-about method; given the laptop's limited RAM, assembler is the best alternative to BASIC. —*Ed.*



I want to welcome you back. Missed *Portable 100*. The August issue was very good, and keep up the same effort.

This won't make Tandy very happy, but the two articles on the 102 convinced me that I don't need to discard my old Model 100 and buy a new portable. Thanks.

I would like to see the following:

1. How to combine the Model 100 with MS-DOS machines as portable and fixed systems that talk to one another.

2. How to use the Model 100 with instrumentation, like a 4-by-5 camera film plane exposure meter that can be used in the field.

3. Why not have your BASIC programs listed in bar code so that one doesn't have to copy the listings by hand. Or how about having a monthly disk with the program listings on it?

Warren L. Dowler
Sierra Madre, Calif.

If your exposure meter produces analog voltage output, a simple analog-to-digital converter like the Kevin Jones's Datamite (page 20, August 1987) might do the trick.

Regarding BASIC program listings, our editorial staff are presently considering all the options. —*Ed.*

I echo with pleasure your statement on the cover wrapper of the new *Portable 100* — At Last!

I offer bouquets with one small brickbat.

The article on how to build the Datamite was right down my alley. It was clear and accurate; it alone was worth the subscription price to me. It fills an application use in my business.

The ability to purchase a complete kit of necessary parts for construction is great. In the past I have been frustrated for having to go to various suppliers for necessary parts. Wherever possible in construction articles, I would like to see more of the same.

I like your layout format of equipment and software reviews up front; I can skip those unsuited to my needs, giving quick access to the "meat" of the technical articles.

However, the page jump in articles still bothers me. It breaks the reader's train of thought.

Again, though, kudos are in order for your first issue. Please keep up the high-quality content. I shall look forward to it each month.

Wendell R. Henry
Fredericksburg, Tex.

Do you have any questions, suggestions, news or commentary? Don't be shy — send your article ideas to the Editor at 80 Elm St., Peterborough, NH 03458.

Tandy Computers:
Because there is
no better value.™

The Choice Is Yours

Pick the lightweight portable that suits you—whatever your needs.

The Tandy® 102—only $499. This slim, light portable gives you complete computing power at a portable price. Its small size makes it ideal for people on the go. With five built-in programs, the Tandy 102 is ready to go to work right away. Use the 102 as a personal word processor, address/phone directory, appointment calendar, telephone auto-dialer and modem. You can even write your own programs in BASIC.

The Tandy 200—more power for only $799. It's ideal for accountants, financial planners, or anyone who works with figures. You can perform sales forecasts, budgeting, pricing, engineering calculations and more. The Tandy 200 features BASIC programming language, a built-in direct-connect modem and a larger 40 × 16 display with double-height characters for maximum legibility. Built-in Multiplan™ makes spreadsheet analysis a snap. You also get an enhanced version of the Tandy 102's word-processing program, as well as an appointment calendar, address-and-phone directory, and telephone auto dialer.

Need more storage? Add our battery-powered Portable Disk Drive 2 for only $199.95. You'll be able to store up to 200K of data on a standard 3½" disk.

Send me a new 1988 computer catalog.

Mail To: Radio Shack
Dept. 88-A-1124
300 One Tandy Center
Fort Worth, TX 76102

Name _____
Company _____
Address _____
City _____ State _____
ZIP _____
Phone _____

Radio Shack®
The Technology Store™
A DIVISION OF TANDY CORPORATION

Multiplan/TM Microsoft Corp.

Circle 42 on Reader Service Card

Tandy's New Dandy

The big plunge into the MS-DOS pool.

by Roger Strukhoff and Alan L. Zeichick

The Tandy 1400 LT sports two 3.5-inch disk drives, a large clear liquid-crystal display, plenty of status indicators and a full-size keyboard.

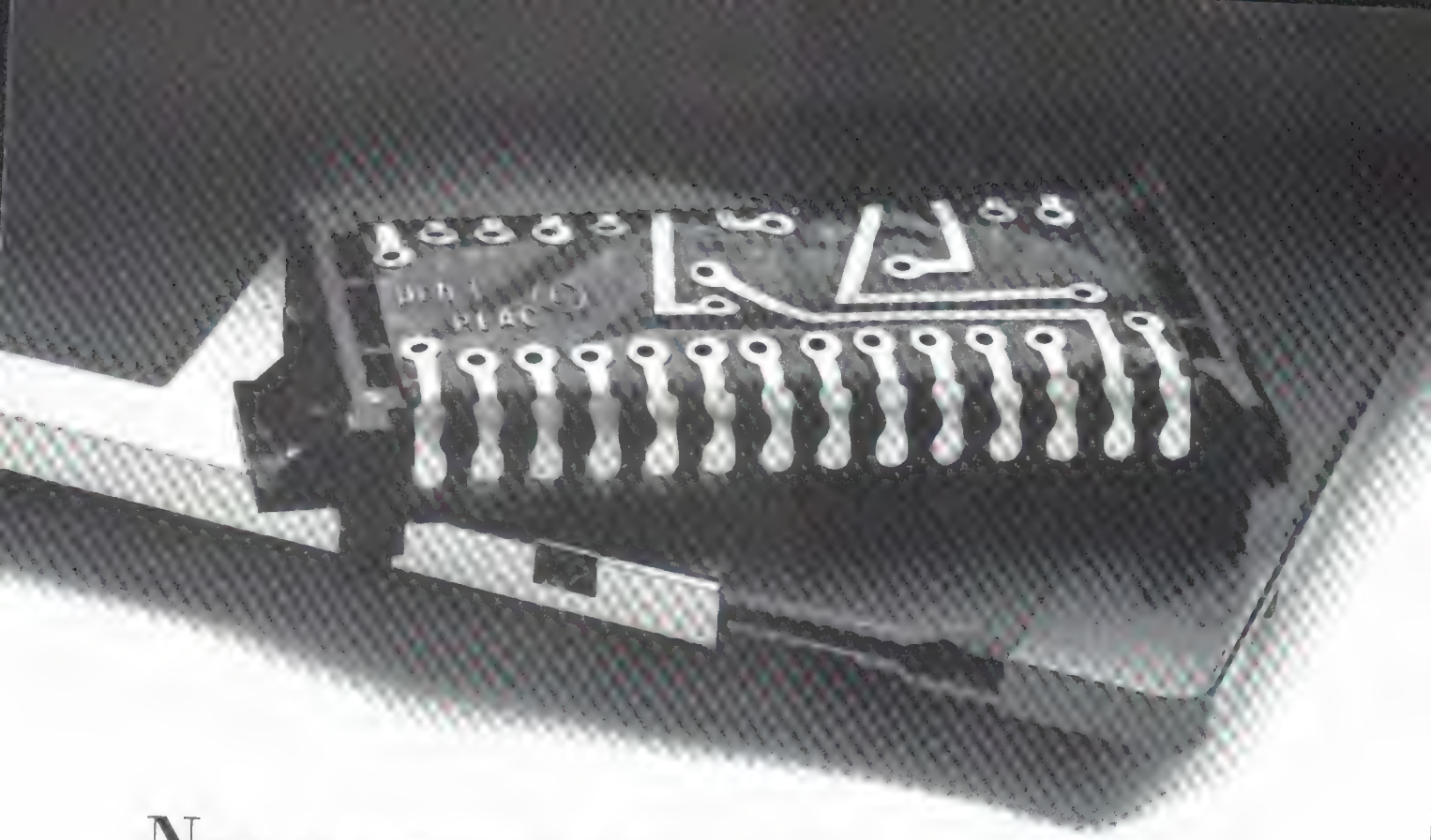
The slide-up back cover reveals connectors for the AC adapter, external RGBI or composite monitor, 101-key enhanced keyboard, nine-pin RS-232, parallel printer and optional modem — plus the "mystery" port.

Tandy, king of the notebook computer, has finally tossed its crown into the crowded laptop ring with the Tandy 1400 LT, a 13.5-pound MS-DOS-based system, was announced on August 3, 1987. Tandy enters the full-featured laptop market three to four years after some companies, and seems to have learned a lot from the others' mistakes.

The 1400 comes with just about everything you need: Two internal 3.5-inch disk drives, 768K standard RAM, backlit supertwist LCD and a host of standard interface connectors. It is powered by a 7.16-MHz NEC V-20 (Intel 8088-compatible) microprocessor, which makes it slower than 80C86-based competitors like the Toshiba's 1100+ and Grid's GridLite, and much slower than the blazing V-30-based NEC MultiSpeed. But it will be faster than the IBM PC Convertible. The 1400 also comes with a removable battery pack.

Tandy's product buyer for this product line, David Frager, defines his market as "8/16-bit processing, battery-operated, two drives, little expansion and LCD screens." Frager says the 1400 "will compete with the IBM Convertible, Toshiba 1100+, Zenith Z-181, GridLite and NEC Multispeed." (The new Sharp 4501 and 4502 will be added to that list.) The 1400 should compete quite successfully with these systems, given its price, range of features and Tandy's coast-to-coast Radio Shack distribution.

A concealed panel reveals the removable battery pack. Users can carry spare rechargeable packs, each good for four hours continuous use.



Now you can put your own programs on a plug-in ROM chip.

A custom ROM service designed especially for corporate and government clients.

Now, Traveling Software can transform your own BASIC or machine code programs into executable applications in a built-in ROM chip—by using a process called "Guardian" that took two years and thousands of man hours to develop.

Fast, simple, economical and guaranteed.

It's a very simple, speedy process to have your own applications "burned" into a plug-in ROM chip. All you do is send Traveling Software your programs on a disk with a check for $500 for your first ROM. Then, the Traveling Software engineers will convert your program(s) into a plug-in ROM chip.

Quantity purchases can achieve a per ROM cost of only $49, with full credit for the initial $500 cost. Normal service turnaround is 7-10 working days. Optional rush service of 24-48 hours is possible.

Combine Traveling Software Programs with your own.

For orders of 50 or more custom ROM's, Traveling Software is offering the option to combine popular products like TS-DOS, T-Word, IDEA!, or T-base with your programs on a single chip.

Build your own "ultimate ROM" using any Traveling Software product with your own custom applications.

The possibilities are endless! For instance, you can even join a bar code reader data logging application with the disk access powers of TS-DOS and put it on a single plug-in chip!

Tandy and NEC Computer Sales.

Looking for a Tandy Model 100/102, 200 or NEC PC-8201 laptop computer to go along with your custom ROM's? Traveling Software is now an authorized distributor of these computers. Let Traveling Software take care of all your laptop computing needs with just one purchase order!

- Proven technology, thousands of Guardian ROM's have been installed since early 1985.
- Traveling Software has years of experience with laptop computers and ROM technologies
- Economical solutions to many applications, as low as $49 per custom ROM
- Built-in future protection! Program changes can be "reburned" into existing chips without replacing costly CMOS ROM chips

A few current Guardian ROM customers:

- Associated Press
- McDonald's Corporation
- Swiss News Agency
- Matrix Instruments, Inc
- Professional Growth Associates
- Biolabs Inc
- Shell Pipeline Company
- Del Mar Avionics
- Business Systems Design, Inc
- Ocean State Scale
- Pruett Industries
- Specialty Instruments

[redacted]

Tom Villars
Project Manager
Enterprise Systems, Inc

CUSTOM SERVICES

*For your FREE **ROM** information kit call toll free*

1 800 343-8080

Or write: **Traveling Software**
North Creek Corporate Center
19310 North Creek Parkway
Bothell, Washington 98011
206-483 8088

TRAVELING SOFTWARE

Circle 72 on Reader Service Card

TS DOS, T-Word, T-Base, IDEA! are trademarks of Traveling Software, Inc.
Guardian is a trademark of Data Engineering.

FEATURES AND PORTS GALORE

Frager and others at Tandy feel the removable battery pack to be a key selling point of the 1400. Battery life is rated at 4 hours, less than other machines in this class, but Frager notes that "our rating is based on backlighting being on all the time; in fact, you can't turn our backlight off." Even an honest four hours goes by quickly when the machine is on the road, so Tandy has designed the removable battery pack believing that savvy users will simply carry a spare or two on the road with them. One drawback of the current system, however, is that the battery can only be charged while mounted inside the Tandy 1400 LT; at present, there's no external battery charger available.

By the way, the portable will work off of 120-volt AC, with its external AC adapter. Recharge times for the battery: 16 hours for a new or "dead" battery, overnight if the battery's merely low. The computer may be used while the battery is charging.

This design feature in part accounts for the 1400's heft: 13.5 pounds, at the top of this class, heavier than the Toshiba 1100+ (10 pounds), the Zenith Z-181 (12 pounds), the NEC Multispeed (11 pounds), certainly heavier than the GridLite (9 pounds), heavier even than the Convertible (12 pounds). But of course, the Tandy 1400 LT comes complete with built-in carrying handle.

With a base price of $1,599, Tandy's price sets the pace for the full-featured lower end of the laptop market. The Datavue Spark and Toshiba 1000 cost less, but offer a lot less, too. The Sharp 4501 costs $1,295, but does not have a backlit screen, contains far less standard memory and boasts fewer features. The IBM PC Convertible now approaches within $100 of Tandy's price, but Big Blue's offering lacks many of the features of the 1400. And the highly-regarded Toshiba 1100, NEC Multispeed and Zenith 181 are $500 to $1,000 more.

The 1400's screen is at or near the top of the class. Using the latest in Japanese supertwist crystal technology, this two-color backlit screen is quick and has an impressive grey scale. It is 4.25 by 9.5 inches with a 1 to 1.4 aspect ratio and offers a maximum 640-by-200 maximum graphic resolution.

The 768K standard RAM is also a nice feature. Of the total, 128K is available on a "quasi-non-volatile" RAM disk that will not lose data on a "soft" or "warm" boot. Optionally, this extra memory can be used as a print spooler.

The multitude of external accessory ports are also a welcome touch. The Tandy 1400 LT offers the following useful adapters:

> Serial communications ports come in several varieties.

- DB-25 (IBM PC-type) parallel printer
- DB-9 (IBM AT-type) serial port
- RGBI color monitor
- Color or monochrome composite monitor
- External 5.25-inch floppy disk drive (though no drive is currently available)
- 101-key enhanced keyboard

Why the NEC V-20 processor, rather than the Intel 8088 or even the 80286? Frager said the 8-bit V-20 was chosen as the microprocessor for cost reasons. With tariffs hanging over 16-bit microprocessors at press time, the V-20 looks to be a wise choice, since the 1400 is manufactured in Japan.

Tandy offers several options with the 1400: a Hayes-compatible 1,200-bps modem ($199.95), a soft carrying case ($39.95), an Intel 8087 math coprocessor ($250) and a spare battery pack ($79.95).

The keyboard has a crisp tactile feel to it and doesn't feel cramped. There are 12 function keys across the top as well as an embedded numeric keypad. A special function key to the left of the spacebar activates the keypad and other functions, including the caps-lock key. (The NEC MultiSpeed is the only portable in this class with a separate numeric keypad.) But if that keyboard's not enough, Tandy's 101-key enhanced keyboard (standard on the Tandy 3000 and 4000) can be used with the 1400; or a keyboard can be purchased alone for $119.95. With a full-sized keyboard and external RGB monitor, the Tandy 1400 LT is a small, but fully acceptable, desktop system.

Long-time observers know it wouldn't be a Tandy computer if there wasn't at least one strange or unique feature. Here it is: The 1400 has a unique expansion slot that at press time would accommodate absolutely nothing. An external hard drive appears to the most likely possibility option. Look for companies like Traveling Software and Portable Computer Support Group to eventually support the 1400, or other vendors through Tandy's Express Order Hardware program.

The Model 600 will be discontinued now that Tandy has a full-featured, MS-DOS laptop system. The Tandy 102 and 200 are safe, and will be as long as Tandy continues to sell them at a regular pace. □

Readers Take Over

Tandy is not making special efforts to sell the 1400 to Model 100, Tandy 102 and Tandy 200 owners. How many 100/102/200 owners will be interested in the 1400 is a matter of debate. *Portable 100* is very interested in finding out this level of interest. If you have an interest in buying this computer, please circle number 150 on the Reader Service Card. If you have no interest, circle number 151. If you think this computer is a terrible idea and are frankly worried about the future of the 102 and 200, circle number 152.

The Tandy 1400 LT? I love it! Circle No. 150

Aaah, I'm not really interested. Circle No. 151

I hate it! I hate, hate, hate it! Circle No. 152

Portable 100 got a preview of the machine before its initial release, but was not able to do any significant testing. Tandy promised us a system right after the announcement, so readers should see a longer review of the system the next month or so.

Yes, I'd like a little MS-DOS coverage. Circle No. 155

Yes, I'd like lots of MS-DOS coverage. Circle No. 156

No way! I don't want any part of MS-DOS! Circle No. 157

Born to Communicate

What you need to make your local laptop talk to a computer far away.

By Alan L. Zeichick

The Model 100 was born to communicate. It's obvious — check out the multiplicity of features built into the Radio Shack laptop family: RS-232 serial port, 300-bits per second (bps) modem, Centronics-style parallel connector. Not to mention the simple, but effective, TELCOM software.

Let's take a quick overview of this broad field. Computer communications may be a discussion on a special-interest group (SIG) on an online service, reading and responding to electronic mail or telexes, or transferring program or data files from one system to another. Each computer system involved in the communications session needs certain items: A "port," or interface to the outside world; an active connection line between this port and another system; and some variety of software that uses the port and line to do the operator bidding.

In the Model 100 family — the Model 100, Tandy 102, 200 and 600 — much of this is available straight out of the box. There are two general-purpose communications devices, the RS-232 port and the telephone modem. There's software, TELCOM, burned into the system ROM (read-only memory). All that's needed is an active connection. There are four simple options:

- A telephone line and the Radio Shack modem cable (catalog no. 26-1410),
- A telephone line and acoustic cups (catalog no. 26-3818),
- A telephone line and an external high-speed modem. There are several battery-powered units available, including the Touchbase Worldport 1200 bps modem,
- A null-modem serial cable to connect to the RS-232 port.

For simple telecommunications needs, that's all the Model 100 or its siblings need. And if you're connecting two laptops together, you're in business.

BUT WAIT!

Chances are, you're not connecting two laptops together. Instead, your application requires that you talk to your office desktop microcomputer, the company mainframe, or a commercial on-line service. What do we need? Well, let's worry about the physical connection first.

Your office desktop micro, like your laptop, needs a communications port and a method of connecting that port to your Model 100. If you're communicating while in the same room, you need a serial port and cable; if you're calling in on the phone, try attaching a modem to the micro.

Serial communications ports come in several varieties, and you may already have one on your personal computer. Some computers, such as the Tandy 2000, TRS-80 Models III and 4, and the Apple Macintosh, are ready to go. The connectors vary: The Tandy 2000 and

Products mentioned in this article:

Black Box Catalog
A useful catalog of technical supplies and special communications equipment
Black Box Corp.
P.O. Box 12800
Pittsburgh, PA 15241
(412) 748-5530
Circle No. 160

CrossTalk XVI
Communications software for MS-DOS computers
Microstuf Inc.
1000 Holcomb Woods Parkway
Roswell, GA 30076
(404) 998-3998
Circle No. 161

PC-Talk III
Public domain communications software for MS-DOS computers
CompuServe's IBM PC Forum
or your local computer users' group

Telecommuter
Communications and word-processing software for MS-DOS computers.
Sigea Systems Inc.
19 Pelham Road
Weston, MA 02193
(617) 647-1098
Circle No. 162

WorldPort 1200
Battery-powered 1,200-bps modem for Model 100 or any computer with a serial port.
Touchbase Systems
16 Green Acre Lane
Northport, NY 11768
(516) 261-0423
Circle No. 163

X-Tel
XMODEM enhancement for the Model 100 and Tandy 200 TELCOM software
Sigea Systems Inc.
19 Pelham Road
Weston, MA 02193
(617) 647-1098
Circle No. 164

Discover the Technology of Tomorrow –Today!

with CD-ROM Review. The New Magazine of Compact-Disc Data Storage

CD-ROM (Compact Disc-Read Only Memory) has arrived—perhaps the most important storage breakthrough since the computer itself! With the storage capacity of 1,500 floppies on a single disc, it's the technology of tommorrow, here today in *CD-ROM Review*, the new bi-monthly magazine from CW Communications.

In *CD-ROM Review*, you'll be the first to learn the many ways in which business professionals and knowledge workers of all kinds are using—and planning to use—this revolutionary new media standard. You'll track the hardware and the software as each is developed and introduced in the months ahead. You'll identify the applications...see the implications for you, your business and your future.

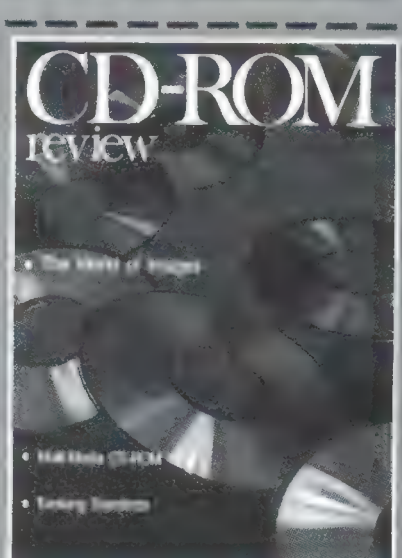
Start now to grow along with CD-ROM as it unfolds with the expert, authoritative articles on such topics as—

- **New applications for:**
  Libraries
  Law
  Science & Engineering
- **Multi-media CD-ROM: storing sound and image**
- **CD-ROM: an alternative to on-line databases**
- **All about CD-I, the consumer side of CD-ROM**

plus...

- **CD-ROM news from Europe and Japan**
- **Where to buy CD-ROM products and services**

and more!



Complete the coupon or mail the attached card to ge
CD-ROM Review coming to you all year long (6 issues)
GUARANTEE: Cancel at any time and receive a fu
refund for all unmailed issues.

YES! Enter my no-risk subscription to CD-ROM Review for one year (6 issues) at just $19.97. If I decide to cancel, I may do so and receive a refund as the guarantee states.

☐ Payment Enclosed
☐ Bill Me

Name/Title

Organization

Address

City/State/Zip

37AB4

Mail to: CD-ROM Review
CW Communications/Peterborough
P.O. Box 921
Farmingdale, NY 11737-0921

Canada $39.97 (Canadian funds) Mexico $24.97, foreign surface $39.97, U.S. funds drawn on U.S. bank. One year only. Foreign airmail please inquire. Please allow 6–8 weeks for delivery.

MOVING?
Subscription Problem?

Get help with your subscription by calling our new toll free number:

1-800-227-5782

between 9 a.m. and 5 p.m. EST Monday–Friday

If possible, please have your mailing label in front of you as well as your cancelled check or credit card statement if you are having problems with payment.

If moving, please give both your old address and new address.

Portable 100
PO Box 959
Farmingdale, NY 11737

TIME ZONE CONVERSION PROGRAM
for the Model 100

Features:
- Converts day, date and time of any time zone in the world to that of any other time zone
- Also displays difference in hours
- Can insert any hypothetical time or computer time
- Compensates for daylight saving time
- Can instantly update computer clock to new day, date and time
- "Remembers" the time zone you are in
- Displays 8 frames of cities in 24 time zones —easily customized
- AM/PM entries and readout

Program also includes:
- Digital AM/PM clock
- Easy-set program for computer clock
- Wake-up alarm
- Timer
- Stopwatch

Approx. 15K program-requires 24K Model 100
$23.50 for cassette + $2.00 for shipping (add $5.00 for CHIPMUNK disk) instructions included

Send check or money order to

PORTABLE PROGRAMS
570 W. Stocker St., #211
Glendale, CA 91202
(818) 247-3166

Satisfaction guaranteed or your money refunded within 30 days

Circle 50 on Reader Service Card

Models III and 4 use a 25-pin D-shaped connector (DB-25), the Mac uses a nine-pin D-shaped connector (DB-9), and the Mac Plus uses a little round eight-pin jack (Mini-8). Ask your desktop's dealer about a null-modem cable to connect your desktop to a male DB-25; that's what your Model 100 requires; you should expect to pay between $15 and $30.

If your computer *doesn't* have a serial port already attached to it, you may be able to add one. On an IBM PC or compatible, for example, you may be able to purchase a short RS-232 card, or find one as part of a multifunction expansion board. Again, check with your micro's dealer for specifics.

> All you need is their phone number.

What if you're outside the 50-foot limit for reliable serial communications — say, calling from a hotel room in Oshkosh, Wisconsin back to your office in Newark? In that case, your desktop PC should be equipped with a telephone modem; either an external model connected to an RS-232 port, or an internal unit attached to the machine's system bus (like an IBM PC's internal modem card). If your office has a multi-line phone system, you may need to arrange a special connection with your telephone supplier, or even add a separate single-line telephone to your office.

Talking to a multi-user minicomputer or mainframe is yet another story. Most large computer systems have communications hardware already installed; check with your systems manager for details about access codes and protocols. One thing to watch out for: Large IBM systems don't use the standard ASCII codes; instead, they use a variant called EBCDIC. Your systems manager should be able to help with any data-conversion needs there.

Many minis and mainframes, also, don't conform to the requirements of the RS-232 standard; their serial ports may require special vendor-specific cabling. Beyond your large systems' vendor, an excellent source for special hardware, adapter and cables is the Black Box catalog.

And, of course, if you're connecting to a commercial dial-up computer service, you don't need to worry about *their* hardware problems. All you need is their phone number.

SOFTWARE NEEDS

The Model 100 family is unusual in having telecommunications software included in the operating system. If you're trying to do more than transmit simple document .DO files between two Model 100's (which is all TELCOM can handle), you'll need to buy a program or two.

If you want to transmit more than a straight ASCII text file — say, use a remote system as a depot for .CO or .BA files — TELCOM alone can't do the job. You need a laptop program that will handle one of the error-checking protocols. At the moment, the only such protocol implemented on the Model 100 is XMODEM; the best commercial option is Sigea System's X-TEL. There are also some public-domain XMODEM programs available.

If you're using a desktop system, that will need software too. Popular communications programs that can handle XMODEM are Microstuf's CrossTalk, Andrew Fluegelman's PC-TALK III and Sigea's Telecommuter series. There are communications programs for every microcomputer color, style and operating system.

And, if you want to set up a small bulletin-board system so that your personal computer can run unattended, look for software that offers "remote mode" or "host mode" services.

Minicomputer and mainframe users: You may have trouble finding software for your larger system that can handle XMODEM; that protocol seems to be limited to microcomputers and dial-up commercial services. Talk to your software vendor to find out what's available.

Communications with the Model 100 family will be examined more in-depth in future issues of *Portable 100*. If you have a communications problem that you can't resolve, or if your Model 100 talks to a minicomputer or mainframe, please drop me a line. I can pass your comments and suggestions on to the rest of the laptop world — a world which is getting larger, but growing smaller, every day.□

SOUNDSIGHT ANNOUNCES

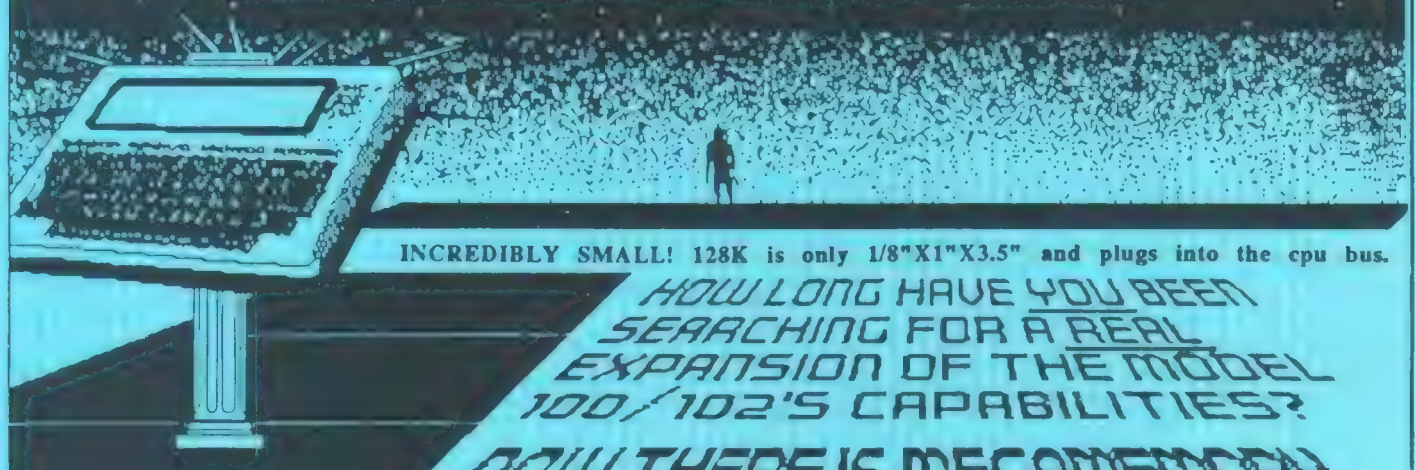
MEGAMEMORY

A NEW ERA IN RAM.

128K TO 10 MEGABYTES

RAM EXPANSION FOR THE TANDY 100 AND 102 COMPUTERS

CREATES AND EDITS* FILES AS LARGE AS THE AMOUNT OF RAM PURCHASED. FULL I O FUNCTIONS IN BASIC. FASTER, IN SOME APPS, THAN THE MODEL 100/102. OPTIONAL 4 PLACE ROM BANK. PARALLEL CPU BUS. TOTAL SIZE OF 1 MEGABYTE MODULE IS 1"X1.3"X3.5". DOES NOT COVER COMPUTER'S I O PORTS OR BATTERY COMPARTMENTS.



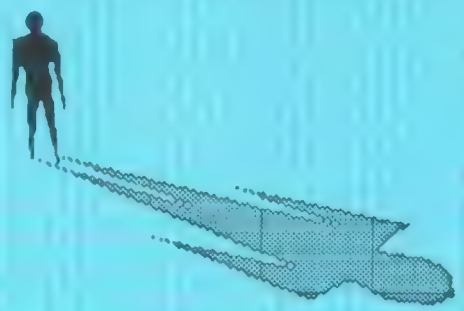
INCREDIBLY SMALL! 128K is only 1/8"X1"X3.5" and plugs into the cpu bus.

HOW LONG HAVE YOU BEEN SEARCHING FOR A REAL EXPANSION OF THE MODEL 100/102'S CAPABILITIES?

NOW THERE IS MEGAMEMORY.

Utilizing the same proven operating system software SoundSight placed in Standard Oil Service Stations from Alaska to Florida, MEGAMEMORY now offers FULL TEXT EDITING of files of any size existing in the RAM bank. *Text Editor Priced at $75.00

Currently undergoing tests for use by the LA Co. Sheriff's Dept, Megamemory also offers 3rd Party Development,(C language), POS systems and Vertical Market Applications.



The advantage of our widely used operating system lies not only in providing the first Text Editor accomodating model 100/102 files greater than 32k, but in our coming support software which includes the Text Editor, Spreadsheet, and Database.

PRICES: 128K-$329.00, 256K-$529.00, 384K-$625.00, 512K-$699.00, 640K-$769.00, 768K-$839.00, 896K-$899.00, 1 MEGABYTE-$965.00.

Additional memory prices available up to 10 megabytes in bottom mounted RAM pan. All RAM bank modules are actual byte sizes listed and do not include the Model 100 or 102's RAM.

CONTACT:

SOUNDSIGHT MBM INC. 225 W. Broadway, Suite 509, Glendale, CA., 91204 Ph (818) 240-8400

Circle 76 on Reader Service Card

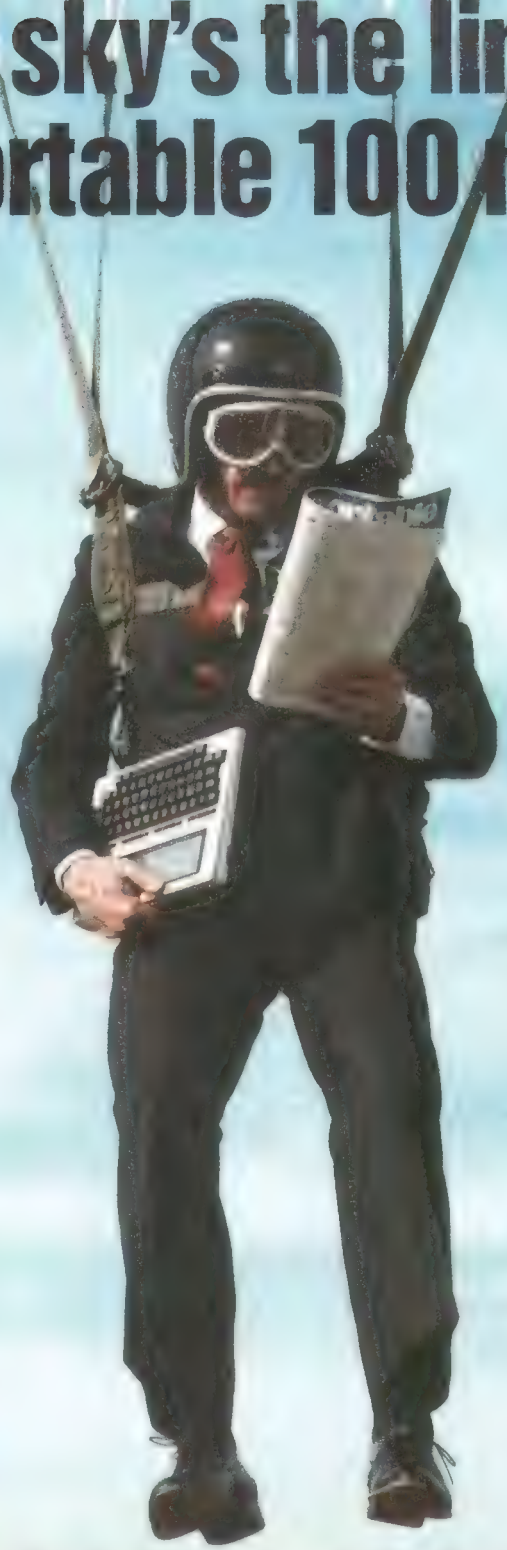
The sky's the limit... ...with Portable 100 magazine.

On the road . . . at home . . . in the office. . . in the air. . . the variety of tasks you can perform with your Tandy portable is expanding constantly.

To keep fully informed and up-to-date about current trends, new products, and new uses for your laptop, you need **Portable 100** magazine.

From sophisticated input/output (I/O) calls and their applications, to simple disk drives, **Portable 100** magazine covers it all.

Portable 100 gives you features, news, columns, and reviews that are thorough and timely. And they are written in a fast-paced, easy-to-read style, by leading experts in the computer field.



In upcoming issues you will discover. . .

- how new peripherals can make you more productive.
- more efficient ways to communicate with your desktop.
- where to buy low-cost public-domain software.
- how your business can be more profitable with your portable at your fingertips.
- where to find the best bulletin boards and information services.
- and much more!

Don't miss even a single valuable monthly issue. Fill out the coupon below, or to charge it to your credit card, call toll-free

1-800-258-5473

In N.H. call 1-924-9471.

Send no money now! We will gladly bill you.

☐ **YES!** I want to explore ways to be more productive with my Tandy portable. . . and save 47% off the newsstand price. Send me a year's subscription (12 issues) of **Portable 100** for $24.97.

☐ Payment enclosed ☐ Bill me

Make checks payable to **Portable 100**

Name _____

Address _____

City _____ State ___ Zip ___

Canada $45.97 (Canadian funds), Mexico, $29.97. Foreign Surface $44.97. One year only. U.S. Funds drawn on U.S. banks. Foreign Airmail, please inquire. Please allow 6-8 weeks for delivery.

MONEY BACK GUARANTEE:
If you are not completely satisfied with **Portable 100** you may cancel your subscription and receive a full refund. Please allow 6-8 weeks for delivery of your first issue.

37AB4

Mail to: **Portable 100**, CW Communications/Peterborough, P.O. Box 959, Farmingdale, N.Y. 11737

Build Your Own Spike Protector

You can complete this project in about an hour, and it might save your computer from a truly shocking experience.

By Mike White

I've had nightmares about all of the awful things that could happen to my portable computer. Most likely, the only *realistic* one was that my Model 100 would be struck by lightning.

I decided to put an end to the worrying by protecting my computer once and for all. After all, the integrated circuits that make our portables live and breath are incredibly vulnerable to high-voltage spikes. A single zap from something as simple as walking across a rug on a dry day can produce enough voltage inside a chip to ruin it.

And the AC power lines are rife with voltage spikes generated by all manner of things, like motors starting and stopping, circuit breakers tripping, and lightning strikes on or near the power lines. Computers are so sensitive to these spikes that a whole industry has sprung up around protective devices. Most of these devices are based on a simple protective component called a Metal Oxide Varistor (MOV).

These little jewels, about the size of a dime, are wired across the power lines and normally work like an open circuit; that is, the system acts like they aren't there. But when they are hit by a high-voltage spike, for an instant they act like a short-circuit, draining away the spike and protecting the circuit they're attached to.

Radio Shack and others make many different models of these protectors, and they will do a fine job of protecting your portable computer when you're using AC power. Of course, when you're using battery power, AC line spikes are not a problem.

TELEPHONE SPIKE

There is another spike danger, though, that is not as well known as power line spikes: telephone line spikes. These can be just as devastating to your portable computer if it's plugged in for telecommunication. Portable computers are especially vulnerable to these spikes because their modems are built right in. A lightning strike on or near the phone line can induce a spike of a thousand volts or more, and this spike can travel for hundreds of miles along the phone wire, right to your portable computer. Your display will light up a bright purple, spell out "ouch!" in capital letters, and die — leaving you with a pile of cooked silicon where your favorite computer used to be.

> Everything south of the modem had to be replaced.

I speak with the voice of bitter experience; I recently lost a computer to just such a spike. I had an old CP/M system, and was on-line to a bulletin board during a thunderstorm. Just as lightning flashed in the distance, the monitor starting spouting gibberish, the printer backspaced twice, and the system expired. The postmortem revealed that everything south of the modem was fried and had to be replaced. I wasn't about to let the same thing happen to my trusty Model 100.

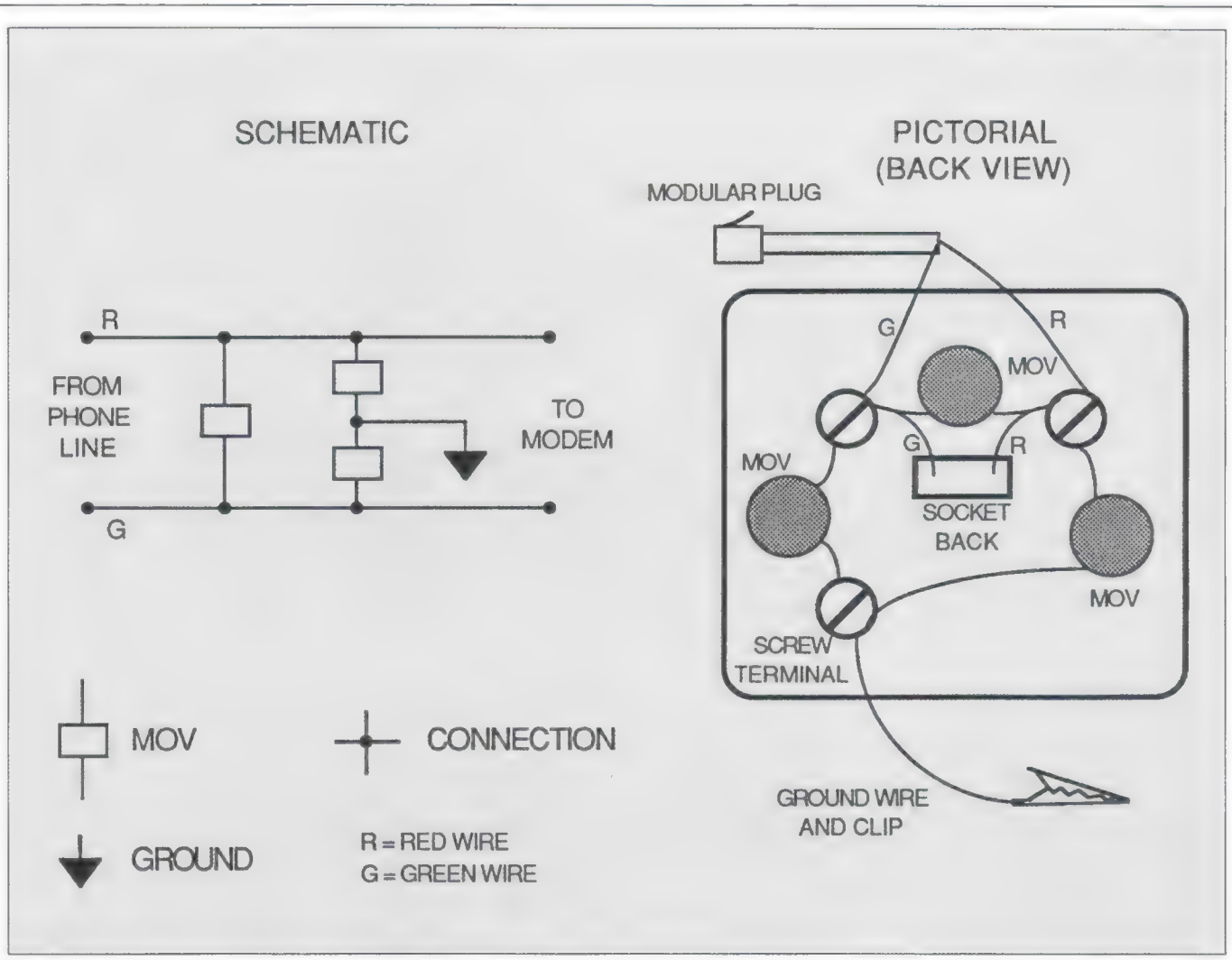
My local Radio Shack store provided all the parts to build this protector for about $10. No computer modifications are necessary, and no soldering is required. The case for the spike protector is made from a telephone adapter, Radio Shack part number 279-353A. This is a small plastic cube meant to interface spade lug wire ends to a standard modular telephone plug. For our purposes, it's a nice small box with a modular telephone jack.

TAKE A LOOK INSIDE

Inside the adapter box, you'll find four wires: red, green, yellow and black. These wires come from the back side of the modular socket and end in spade lugs attached to four screw posts. Partially unscrew these posts and unhook the black and yellow wires from the posts. Remove the lower right screw and discard it. Carefully cut off the black and yellow wires near the socket. (The telephone system is basically a two-wire circuit, using the red and green wires. The black and yellow ones are not used in normal home phone hookups today.)

At this point, you should have three screw posts left: one with a green wire, one with a red wire and one with no wire. The last of these will become our ground post.

The MOVs we'll use are Radio Shack



part number 276-570B. There are other types of MOVs available, but the ones I've selected have a higher voltage rating. You will need three of them.

The spikes we want to clip come in two flavors: common and differential. All that really means is that the spikes can appear between the two lines of the telephone circuit, or between either line and ground. We'll use a MOV to cover each possibility.

Connect one end of an MOV to the screw post with the green wire. You will need to trim the MOV lead to length after you wrap it around the post. Connect the other end to the post with the red wire. Now, connect another MOV from the post with the green wire to the ground post. Finally, connect the remaining MOV to between the post with the red wire and the ground post. The MOVs fit nicely in the case at the top and tucked down along the sides. Leave all three screws loose for now.

The next connection is the output lead. This is Radio Shack part number 279-391, a 12-inch long, four-conductor wire with the spade lugs on one end and a modular plug on the other. Carefully cut off the black and yellow leads near the end of the insulation. Tie two knots in the remaining red and green wires to shorten them. Connect the green wire of the output cable to the post with the green wire, and the red to the red.

Telephone lines also carry high-voltage spikes.

One more wire to go. When lightning strikes, the energy in that thousand-volt spike has to be directed somewhere. Otherwise, it will leak all over the place and zap your computer *despite* the MOVs; we must provide a path to ground.

Select a length of hookup wire and connect it to the ground post. You'll want to use stranded wire because it's more flexible, making it easier to roll up for storage. This ground wire can be as long as you want, but must be at least long enough to reach from your telephone hookup to a convenient ground. You can put an alligator clip to the end of the ground wire to make it easier to attach, if you wish. Tighten all three screw posts securely, making sure that none of the wires or MOV leads slip out.

The telephone adapter we're using as the case was intended to be attached to a wall, and so has no back. You can simply leave it open, or if you're a neat-nut like me, you can fashion a back plate out of any convenient material,

like heavy tagboard or plastic. I traced the shape of the case on the side of a plastic kitchen container, cut it out with a utility knife and attached it to the case with some of that space-age super glue. This works fine, as long as you don't glue your fingers together in the process.

THE TEST

To use the protector, just plug the telephone cable from your computer into the socket on the protector case. Then plug the output lead from the protector into your regular phone jack,

> Model 100s are especially vulnerable due to their built-in modems.

and attach the ground cable to any convenient ground.

The screw that holds the face plate on any electrical outlet will do; just back it out a few turns and attach the ground wire from your protector. Don't insert the ground wire into any of the electrical outlet holes, of course; that would be very dangerous to both you and your computer. If an outlet isn't handy, you can use a cold-water faucet or pipe as a ground.

If you want to get fancy, and don't mind a little extra bulk in your standard kit, you can use a standard three-prong power plug as your ground attachment. Get a plug with screw terminals, and attach the ground wire from your spike protector to the ground terminal of the plug; this is the round middle connector between and below the two flat blade AC connectors. Don't, under any circumstances, attach anything to the AC power connectors: *leave them unconnected.* You can now plug into any handy three-prong outlet, and presto — instant ground.

The MOVs will protect your computer against most spikes that find their way onto the phone line, but will not protect against a direct, nearby lightning strike. It's always safer and wiser to disconnect your computer from the AC and phone circuits when lightning is very near.□

THE power pole.

Rechargeable Power-House for Tandy Models 100, 200, 102 and many other 6V. devices

- **SAVES MONEY** — Almost FREE POWER — only pennies per day.
- **MORE UPTIME** — 8 to 15 hrs. per charge — even usable while charging from your transformer.
- **ADJUSTABLE** — Screw adjust legs provide perfect height support.
- **RELOADABLE** — Allows easy insertion of the Ni Cads of your choice.
- **DURABLE** — Yet lightweight. Superior quality, satin-finished, machined aluminum.
- **CONVENIENT** — No more awkward Ni Cad exchanges from charger to computer.

$34.95 Plus postage

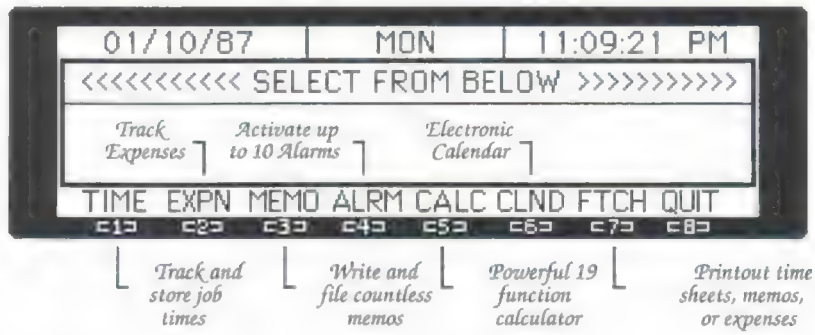
the portable power co.

P.O. BOX 2343, BOISE, IDAHO 83701 (208) 345-8292

PATENT PENDING

Circle 66 on Reader Service Card

At last, a program designed for people who dread filling out time sheets.



We all hate filling out time sheets. That's why there's The Executive Diary. Just enter a job number and it records time while you're using other functions, other programs, or even while the computer is turned off.

But that's not all. The Executive Diary comes with an expense tracker, a memo pad, 10 alarms, a powerful calculator, and a smart calendar.

So order now. And never dread filling out a time sheet again.

(214) 271-2358. Price $49.95. For Models 100, 102, and 200. Send $3 for Demo. Applies to purchase.

The Executive Diary

Stradivarius Software
1109 Gardengate, Garland, Texas 75043

Circle 64 on Reader Service Card

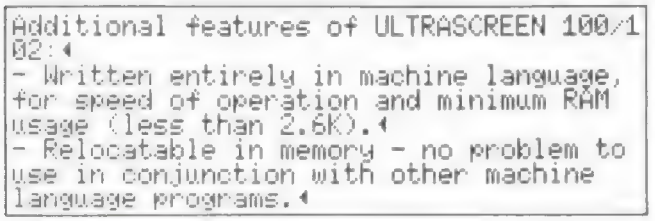
Powerful New Programs for your Radio Shack Model 100/102/200

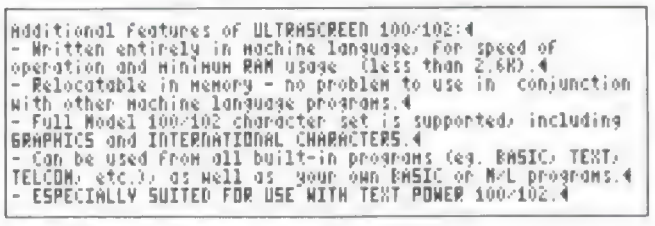
DO NOT ADJUST YOUR SCREEN...

... nothing is wrong with your Model 100/102 that the new ULTRASCREEN™ program won't cure.

Normally, the Radio Shack™ Model 100/102 offers a screen with only a 320-character capacity - 40 characters per line, by 8 lines. Furthermore, if a word is too big to fit at the end of a line, the built-in Text editor shifts the ENTIRE WORD to the next line (this is called "word wrapping"). While this makes the text easier to read (no split words), too much screen space is WASTED at the right of almost every line.

Now, ULTRASCREEN gives you the power of a 60-character by 10-line screen, thereby correcting the main design flaw of your Model 100/102 - the small screen. With no decrease in the legibility of the characters, ULTRASCREEN more than doubles the effective viewing capacity of the 100/102: it increases the total number of characters in the display from 320 to 600, and reduces the number of word wraps by up to 1/3!





FOR CATALOGUE, WRITE:

ULTRASOFT INNOVATIONS, INC.
76 Main Street / P.O. Box 247
Champlain, NY 12919-0247
ORDER LINES:
(800) 448-4511 (U.S. except N.Y.)
(800) 962-1480 (N.Y. state)
(800) 255-1133 (Ont. and Que.)
Ask for Extension 313-18
For product information, call:
(514) 487-9293

Orders shipped within 7 days of receipt (you will be informed of any undue delay). Items ordered together are not necessarily shipped the same day. TEXT POWER, PAGE PLOT and MERGE TEXT are registered trademarks of Hugo Ferreyra.
Copyright ©1987 by UltraSoft Innovations, Inc.

YOU DIDN'T GET WHAT YOU THOUGHT YOU WERE GETTING, DID YOU?

If you bought a Model 100/102 for word processing, you were looking for CONVENIENCE, FLEXIBILITY and PORTABILITY. The problem was, the built-in TEXT program was only HALF a word-processor - it allowed you to enter the data into your computer and edit it, but didn't help you at all to set up that page in an attractive format for printing.

Now, TEXT POWER™, "the best formatter there is for the Model 100", according to reviews in both PORTABLE 100 and CREATIVE COMPUTER magazines, is the key which will unleash the capacity of your 100/102 to give you:

- the POWER to **create or edit text files, and save them to disk or cassette**, without ever leaving the program,
- the POWER to **format text automatically**, with tremendous speed,
- the POWER to **use all the familiar built-in TEXT features,** such as PASTE, CUT, COPY, etc.
- the POWER to **insert text at specified locations in the master text file,** using MERGE TEXT™ (e.g. insert names and addresses in a business letter),
- the POWER to **add headers and footers**, which can be turned on or off (or changed) from within the text,
- the POWER to **right-justify text,** and/or to **center text vertically or horizontally,**
- the POWER to **control left and right margins for the entire text, or for individual paragraphs,**
- the POWER to **number pages automatically in any location,** and
- the POWER to **preview the complete layout of your formatted text graphically, without embedded commands, before printing** (using PAGE PLOT™:

Each version of TEXT POWER is customized for a particular printer, or group of printers, allowing the same commands to be used, even if the actual printer code varies from one machine to another. For example, you can use the following features (individually or in combination, if your particular printer supports them): boldface, condensed, double-strike, elite type, near-letter-quality (NLQ), superscript and subscript, italics, underlining, etc.
TEXT POWER also gives you the ability to send automatic line feeds to your printer, and to advance the paper to the top of the next page, from within the text.
Optional support is available for INTERNATIONAL CHARACTER SETS - including French, Spanish, German, etc. - for use with virtually all printers.

YES! PLEASE SEND ME THE PRODUCTS INDICATED AT RIGHT.

NAME
ADDR.
CITY
STATE ZIP
TEL. (DAY)
PAYMENT BY: ☐ CHK/MO ☐ C.O.D. ☐ VISA/ ☐ MC
EXP.
SIGNED

QTY	DESCRIPTION	PRICE	TTL
	ULTRASCREEN	$34.95	
	TEXT POWER	$59.95	
	8K CHIPS-100	$22.95	
	8K CHIPS-102	$ 9.95	
MODEL: ☐ 100/ ☐ 102			
TEXT POWER ORDERS: Printer: ☐ Parallel/ ☐ Serial			
	SUBTOTAL		
	SHIPPING/HANDLING		4.00
	C.O.D. ($3.00)		
	TOTAL		

Circle 78 on Reader Service Card

TELCOM 600 By Carl Oppedahl

Telecommunicating with your Tandy 600

Although Tandy tried to make it easy, TELCOM 600 is just more complicated.

The RS-232 serial port of the Tandy 600 has been discussed in detail in these pages ("Shaking Hands With Your Tandy 600," January 1986) but recent reader mail suggests that the modem and telecommunications software deserve discussion here as well. In this article I'll describe the built-in ROM-based program TELCOM, and go through a simple longin procedure.

Those who are familiar with the Model 100 and Tandy 102 and 200 know how easy it is to use the built-in software to login to remote databases and other computer services. The autodial modem and direct-connect circuitry allow a successful phone connection without complicated cable hookups and dip-switch settings. The manual clearly explains several login sequences.

The computers do have limitations. Their screens are only 40 characters wide, and downloads are limited to about 29 kilobytes (K). The software doesn't support XMODEM error-checking transfers. If the database you are about to dial requires different communication parameters than the previous settings, you have to adjust them manually. The file that you can set up containing access numbers and login sequences, ADRS.DO, makes no provision for automatic parameter setup.

Microsoft, the designer of TELCOM, also got the byline for TELCOM in the 600, but the program in the 600 has little in common with its namesakes. It supports XMODEM, allows automatic setup of communication parameters and enjoys the luxury of a screen 80 characters wide.

The manual provided with the 600 is poor, making it very hard to sign on to a database since you must master a main menu and at least five of the ten submenus to perform even the simplest login. The ten submenus offer some 42 items you must enter or select, sometimes by supplying a filename, other times by entering a number, and many times by toggling through multiple-choice answers.

The TELCOM software itself contributes to the confusion by displaying menu choices that don't make sense. For example, it offers *Disconnect* as a choice even if the phone line hasn't been connected.

If at all possible, make sure that you can successfully login using a simpler machine like the Model 100 before you try to use Tandy 600 TELCOM to connect with a particular database or computer. When I login to the Official Airlines Guide with the Model 100, I use a stat setting of *M7E1E,20* which may be typed in all at once using the STAT function key. There are also two switches on the side of the Model 100, DIR/ACP and ORIG/ANS; these are usually set for DIR (direct-connect cable) and ORIG (use *originate* modem tones rather than *answer* modem tones). The 600 has a DIR/ACP switch that works the same way, but it has no physical ORIG/ANS switch.

Loading the equivalent of M7E1E,20 pps into the 600 requires three different submenus: the Options menu, the Modify menu and the Connect menu.

Negotiating the menus and submenus of the 600 is done almost solely through the space bar, and Tab and Enter keys. This may be the result of the software having been borrowed from mouse-oriented machines, or could be overkill on someone's attempt to simplify.

Experienced users are usually impatient with menu-driven software since it takes lots of time and dozens of keystrokes to negotiate. In contrast, only half a dozen keystrokes are needed to set all the parameters of the 100. But it is possible for the experienced user to create login files on the 600 that compress several hundred keystrokes into one main menu selection, allowing many menus to be bypassed.

If the menus made a natural progression through the steps required for login, then things would be easier for novices and experienced users alike. With the 600, though, you have to skip over the Answer, Connect and Disconnect menus to the Modify and Options menus first. Then you must go back to the Connect menu. The software itself does not guide you through the menus. And, sorry to say, the manual doesn't clarify matters.

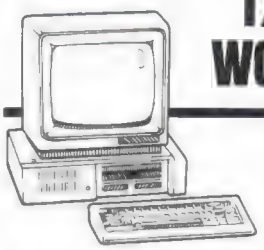
Here's a typical login session for a new user. Start by plugging the direct-connect cable (the same one you used with the Model 100) into the 600, and while you're at the left side of the computer be sure the DIR/ACP switch is set for DIR. Turn the computer on and press Ctrl-F10, if necessary, to get to the main menu. Use the cursor keys to highlight the TELCOM menu entry, and press Enter. The main TELCOM menu appears: *Answer, Connect, Disconnect, Modify, Options, Run, Script, Transfer.*

Select the Options submenu by either selecting it with the cursor or typing the letter *o*. Move from one item to the next, filling in the blanks as shown:

Capture to: (leave blank)
phonebook: (leave blank)
dialing prefix: (leave blank)
area code: (leave blank)
call retries: (leave blank)
dialing type: Pulse
speed: Fast
wait for tone: 2
review text lines: 30
disconnect after: 10

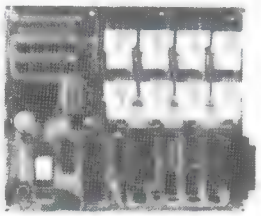
The Tab key gets you from item to item in the Options submenu (as does typing Ctrl-I). Each menu *wraps around*, which means that if you push Tab often enough you'll find yourself back

I/O FOR REAL WORLD CONTROL



$199.95 CALL OR WRITE FOR MORE INFORMATION

MODEL CIP/35A SHOWN WITHOUT COVER



NOW ANY PERSONAL COMPUTER CAN HAVE THE MOST COST EFFECTIVE AND VERSATILE I/O BOARD ON THE MARKET TODAY!

- Serial Link Interface RS-232 or TTL
- 8 Relay Outputs, High Current AC/DC Form A & C
- 8 Opto-Isolated Inputs Plus 8 Bit Counter
- 8 Bit A/D with Span Adjust 0 to 5V, Provisions for up to 8 Input Channels
- EASILY Programmed & Controlled Using BASIC Statements
- Perfect for Lab Work, Machine Control, Security Systems, & Data Acquisition
- Unprecedented Usability as Attested by University, Government & Industrial Users
- Complete Documentation with Software Examples & Total Engineering Support

•IBM •HP •RADIO SHACK •COMMODORE*

* ALL REGISTERED TRADEMARKS

SIAS Engineering, Inc.

831 S. POWERS RD. / SALINA, KS 67401 / (913) 823-9209

Circle 61 on Reader Service Card

Model 100/102 SEARCH.CO Model 200

This program is perfect for the field journalist

- Search and Replace Strings of up to 30 characters in length
- Selective case sensitivity
- **TRUE** Word count function!
- Global file search
- Individual file search/replace
- Written in Machine Language so it USES LESS THAN 2 K RAM

Model 100/102 SPRINT.CO Model 200

Turn out professional quality correspondence

This printer driver and text formatting program includes the following features: • **Soft Print Preview** via pixel plot •

- Variable Line Width
- Hanging Indent
- Word Wrap
- Variable Line Spacing
- Direct Enter Printer Escape Codes
- Flush Left or Right
- Page Numbering
- Auto Page Advance
- Fully Customizable
- Change Format via Menu AND/OR "Text" Format Commands
- Runs virtually any parallel or serial printer up to 19.2 K Baud!
- Machine language program requires under 2.7 K RAM

SUPER CALCULATOR

Turns your MODEL 100/102 or 200 into a scientific calculator!

- Basic Math Functions
- Reciprocals
- Exponential Notation
- Trigonometric functions
- Square Roots
- Three Accumulator Registers
- Results on LCD-and/or stored in text-and/or printed on printer

If not fully satisfied, return within 30 days for a complete refund. TO ORDER send check or money order for $24.95 for SPRINT or $14.95 for Super Calculator or $12.95 for SEARCH.CO plus $2.00 shipping and handling to PEPTONE Software. SAVE Shipping costs by ordering more than one program!

Specify if cassette or Tandy 3 1/2 in. disc. Add $3 for disc

PEPTONE Software
10112 Ebenshire Ct.
Oakton, VA. 22124

Circle 63 on Reader Service Card

at the first item in the menu. Shift-Tab backs you up to the previous item.

Most items will be filled in with letters or numbers, and some may already have an entry. Most of these so-called *default* values may be left unchanged, but some may need to be changed.

To clear a value you don't want, hit the space bar once (which clears the previous contents), then push Bksp (which removes the space).

The way the Tandy 600 menus and submenus are designed, you won't use the Enter key nearly as often as you might think. When a particular menu is on the screen, you should push Enter only *after* you have filled in or modified the entries — otherwise you'll end up at the previous menu. In a rare case you may select a menu and immediately press Enter, but this will only happen where all the menu items happened to be correct.

When you have finished with the Options menu, press Enter to go back to the main TELCOM menu.

This time, select the Modify menu with the cursor. A submenu appears. As before, use the Tab key to move from item to item, setting the values to match those given below.

name: (leave blank)
baud rate: 300
stop bits: 1
word length: 7
parity: Ignore
xon/xoff: no
duplex: Full
terminal: No
add to EOL: None
strip linefeeds: No
filter chars: No

When each of the items has been set up properly, press Enter and you'll be at the main TELCOM menu. Now select the Connect menu. The first item in this submenu is *CONNECT to:*, which should remain blank. If necessary, press the space bar and then the Bksp key to clear it.

Press Tab to get to the second item, *number:*. Type in the phone number you wish to dial. Experienced Model 100 or Tandy 200 users will expect to press Enter next. But with the Tandy 600, you use Tab to reach the final menu entry: *Using modem:*. Since you'll be communicating over phone lines, highlight the *Yes* option. Now press Enter.

The prompt *Dialing...* will appear at the bottom of the screen, followed by *Waiting....* When the distant computer answers, the screen will clear and you'll be connected. You're now ready to enter your user ID and password.

LET'S GET OUT OF HERE

When you're ready to log off, you must somehow get to the main TELCOM menu again. The other Tandy 600 built-in programs all use the Esc key to reach their menu, but TELCOM requires you to type Shift-Esc instead.

At the TELCOM main menu, press the space bar to move the cursor to *Disconnect* and press Enter. The phone line will be disconnected.

Telecommunicating with the Tandy 600 is probably more complicated than it should be, but it's still easy. Once you have all the menus figured out you can move along fairly quickly. There is a capability to set up so-called *TEL* files that allow for fully automated login with a single keystroke. But the manual doesn't explain this fully, and it would require another article to do so here.

Comparatively speaking, TELCOM on the Tandy 600 is not reason enough to opt for this computer over its cousins the Model 100 or Tandy 200.□

THINKING OF UPGRADING?

Think Telecommuter® when it's time to move from your trusty Model 100, 102 or 200 to an MS DOS portable.

Telecommuter is a communications and word processing program that runs on MS DOS portable and desktop computers made by companies like IBM, Zenith, Radio Shack, Toshiba, and Sharp.

The special thing about Telecommuter is that many TC commands are just like those of the Model 100 family.

For example, in the TC Word Processor you'll find Copy, Cut and Select in familiar places. Load and Save are there, too, and they work with disk files and complete DOS directory trees.

TC Telcom has Find, Call, Stat and Term, just where you'd expect to find them on your Model 100. And your ADRS.DO files will work fine on your MS DOS computer.

Can you imagine a Model 100 with MS DOS capabilities?

Well, we can! We added many powerful features, such as Search and Replace, lots of printing options, and file formatting with headers, footers, pagination and justification.

The latest version of TC sports a complete Address Data Base and Mail Merge capability. With Telecommuter, your MS DOS computer can make both voice and data calls. Keep a running call record in a note file attached to each address record in your data base.

Many Model 100 owners use Telecommuter's Host Mode to stay in touch with their office or home computer when on the road. TC Fast File Transfer moves files quickly between your Model 100 and an MS DOS computer over our null modem cable.

Call or write to order Telecommuter for only $200. If you'd like to try our software on your MS DOS computer before buying, ask for a free TC Trial Disk. This disk contains the new TC Address Data Base, so you can put it right to work handling your telephone calls.

Call us today!

1-617-647-1098

Sigea Systems, Inc.
19 Pelham Road,
Weston, MA 02193

Circle 70 on Reader Service Card

Watching the Big Screen

A look at products that expand the Model 100's small LCD.

By Alan L. Zeichick

Admit it. You've been frustrated with the Model 100 or Tandy 102's tiny 40-character by eight-line display, right? I have, after switching from my IBM PC to my favorite portable laptop. And vendors, as always, address users' frustrations.

First, Tandy introduced the Disk/Video Interface. Then Axonix created an external liquid-crystal display (LCD). Next, Traveling Software has offered ways out of the mini-LCD (liquid-crystal display) bottleneck, first with its $39.95 cassette-based T-View 80 and later with ROM-View 80, bundled with the $299.85 Ultimate ROM II. And now the market's heating up, with Ultrasoft Innovation's latest entry, Ultrascreen.

The latter products counteract the screen limitation by redesigning the laptop's character set, squeezing additional characters on to the screen horizontally or vertically. The unmodified Model 100 or Tandy 102 (in this article, we'll use Model 100 to refer to both machines; the screen enhancers are not available for the Tandy 200 or Tandy 600) can display a maximum of 320 characters at one time on the built-in LCD.

ROM-View 80 squashes the screen horizontally, creating a 60-character by eight-line display. That's 480 characters, or an increase of 50 percent. Ultrascreen ($34.95) offers a 60-character by 10-line character set; that's 600 characters, or an increase of nearly 88 percent over the unmodified Model 100.

Don't be scared by the word "modified." These products are software only, machine-language programs sold on ROM, Portable Disk Drive (PDD) disk and cassette tape. The programs switch between the regular eight-by-40 and condensed displays, depending on the context.

CAN YOU READ THIS?

Obviously, smaller characters aren't as easy to read as large characters. The default Model 100 character is an eight-by-five dot-matrix pattern; ROM-View 80 creates an eight-by-four pattern, and Ultrascreen a six-by-four matrix.

> Ultrascreen is both easier and more complicated than ROM-View 80.

Interestingly, I found the Ultrascreen characters slightly easier to read than the taller ROM-View 80 characters. And the Ultrascreen characters are truer to the original Model 100 design, since ROM-View 80 displays all high-order characters (ASCII 128 through 255) as inverse-video versions of the low-order characters. In Ultrascreen, the high-order characters are smaller, somewhat distorted versions of the regular Model 100 high-order graphics and special characters.

To make matters more interesting, Ultrascreen includes a custom character-font building program, FONT.BA. The BASIC program modifies the six-by-four matrix for any ASCII character; for example, I managed to place a horizontal line on the number 7, and change the Grph-1 symbol to a "happy face."

The font editor actually modifies the Ultrascreen .CO machine-language file; after the changes this file, with the new custom fonts, can be stored on a blank 3.5-inch disk or on cassette for future use. Actually, the Model 100 can store several versions of the Ultrascreen program; I found that I was able to switch easily between the unmodified and happy-face versions of the program.

PLUG 'N' PLAY

Both ROM-View 80 and Ultrascreen are easy to install and use. ROM-View 80, as its name implies, is on a Read-Only Memory (ROM) chip, bundled as part of Traveling Software's Ultimate ROM II. If you don't own Ultimate ROM II, or wish to use the screen enhancer with another software package, Traveling Software's older T-View 80 package is still available, but only on cassette.

Once the Ultimate ROM II is installed, selecting *UR-2* from the Model 100 main menu reveals the ROM's own menu, which includes applications such as T-Word and Idea!, gateways to Model 100 built-in software (BASIC, TEXT and TELCOM) and a *View-80* switch. Selecting *View-80* results in the prompt *Width:*; enter an screen display width between 10 and 80. Any number larger than 60 will result in horizontal scrolling — usually only desirable when formatting a document for printing.

ROM-View 80 only works in applications selected through the Ultimate ROM II menu. Choosing TEXT, BASIC or any other UR-2 item after ROM-View 80 is enabled will display the enhanced screen. With both ROM-View 80 and Ultrascreen, only applications are enhanced; the main menu remains in the standard eight-by-40 mode.

The sole exception is TELCOM; the normal display, even with ROM-View 80 enabled, is the unmodified eight-by-40. Once in TERM, pressing the down-arrow key activates *TELCOM-80*. Special, but unmarked, key combinations in TELCOM-80 control the telecommunications session: *F1* followed by *D* selects downloading, *F1* and *W* changes the display character width and *F1* and *S* activates "snoopy" mode. Snoopy mode is a handy utility, known on some systems as *debug* or *monitor* mode, which lets you monitor control characters (ASCII 0 through ASCII 31) coming across the communications line. These codes are displayed in a common format: Two tiny letters for each character, such as *FF* for ASCII 12, form feed, *CR* for ASCII 13, carriage return, and *HT* for ASCII 9, the regular horizontal tab.

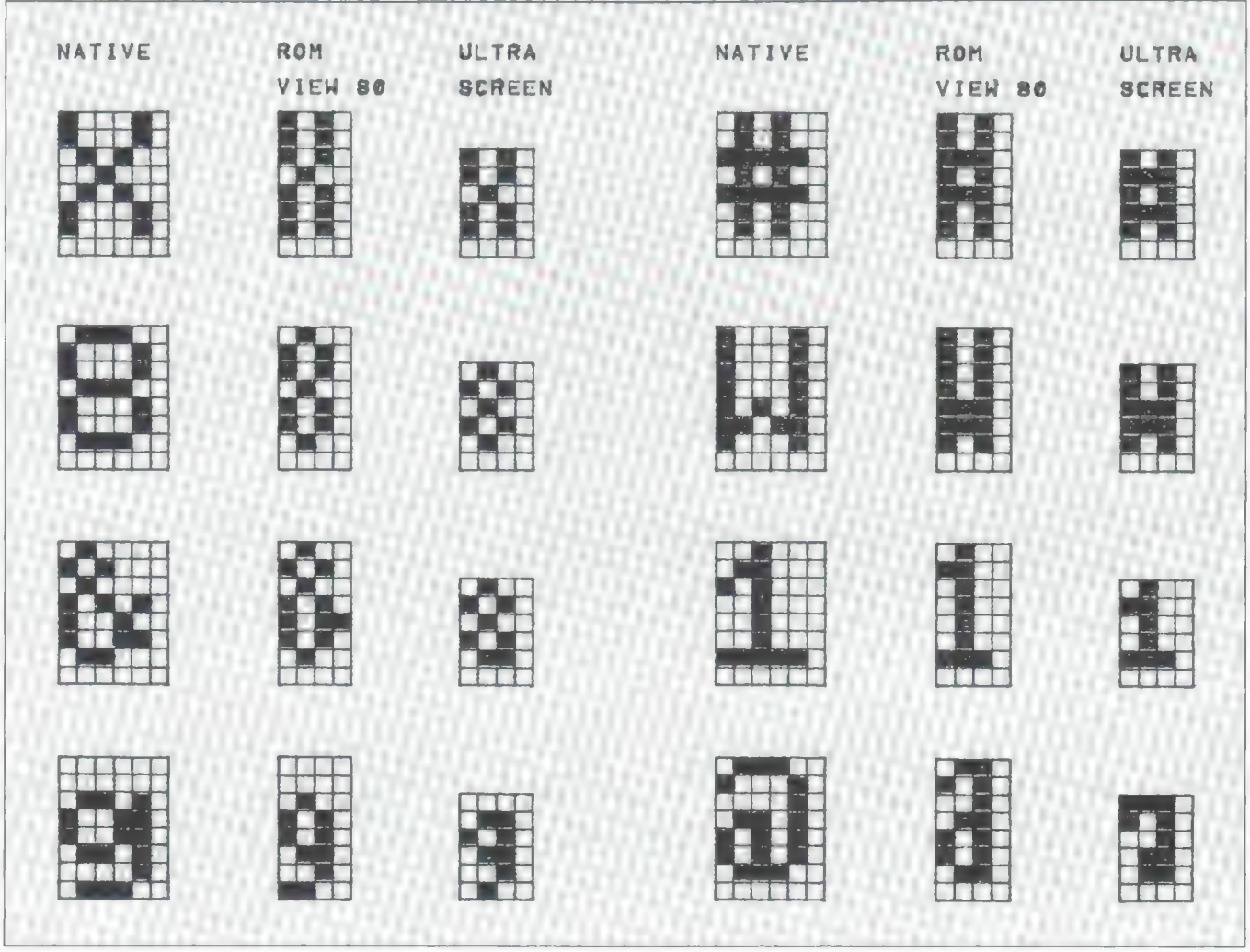
The enhanced screen can even be controlled by a BASIC or machine-language program. The ROM-View 80 manual lists memory addresses that can be examined or changed to activate or deactivate ROM-View 80, adjusting the display width, and activating or deactivating horizontal scrolling.

Ultrasoft Innovation's Ultrascreen is both easier and more complicated to install. Provided on both cassette and disk, two versions of the software are available: USC100.CO and USC102.CO, for the Model 100 and Tandy 102, respectively. Once loaded into the laptop, the BASIC statement CLEAR 0, 56610 reserves high-level memory for the screen modifier.

At the main menu, selecting USC100.CO (or USC102.CO) results in only one change: The names of the built-in utilities, BASIC, TEXT, TELCOM, ADDRSS and SCHEDL, are changed to upper-and-lower case. That's the only, and subtle, indication that Ultrascreen is ready to go.

But enter any application — drop into a text file or start BASIC — and you'll see Ultrascreen at work. Characters are smaller, there are more lines on the screen, and it's just as if the Model 100 always worked that way. In applications that have a bottom-line function-key menu, the LABEL key works as usual, but the key labels scroll up a line, and disappear again; harmless, but disconcerting. With LABEL turned off, there's no difference, even

A Comparison of Model 100 Screen Fonts



The Screen Update

I would never have expected it: Both ROM-View 80 and Ultrascreen speed up the Model 100's screen display.

Text is written to the liquid-crystal display (LCD) quickly and efficiently in the unmodified Model 100. And I assumed that the patches made by ROM-View 80 and Ultrascreen would slow down that process — perhaps even drastically.

I was wrong. Maybe because the characters are smaller, maybe because the scrolling routines are called less often; in any event, both products enhance the Model 100's LCD operations.

In one test, I wrote a BASIC program to print the numbers from 1 to 10,000 on the screen. In another, I transmitted a large, 45,113-character document file from an IBM PC to the Model 100 at 9,600 baud (STAT: 87N1E); the file was merely displayed on the screen, not captured to RAM or disk. In both tests, I timed the operation, and found that the screen enhancers made a significant difference with programs that performed a lot of screen updating — especially scrolling.

Here's the BASIC program used for the first test:

```
10 X$ = TIME$
20 FOR I = 1 TO 10000
30 PRINT I;
40 NEXT I
50 Y$ = TIME$
60 PRINT X$; Y$
```

The following table summarizes the speed increases caused by ROM-View 80 and Ultrascreen. With ROM-View 80, tests were run at three screen widths: 80, 60 and 40 characters across.

ROM-View 80, while set at a full 80-character width LCD, offered the maximum speed increase; Ultrascreen is slower than ROM-View 80 — but still quicker than the unmodified Model 100. On the other hand, ROM-View 80's display was inconsistent during the TELCOM test; sometimes it truncated the first 20 characters of each line, only displaying the right-most section. This was fine at a width of 80 — but it even acted this way at a display width of 40, showing only the right-most 20 characters of each line.

—Alan L. Zeichick

	BASIC COUNT	TELCOM TRANSFER
Regular Model 100	12:37	7:39
ROM-View 80 at 80	6:13	5:02
ROM-View 80 at 60	7:29	5:16
ROM-View 80 at 40	10:47	6:10
Ultrascreen at 60	9:30	6:42

in TELCOM.

Turning the enhanced characters on and off is simple from BASIC. There's a new keyword: SCREEN. SCREEN 1 selects the ten-by-60 screen, SCREEN 0 returns to the eight-by-40 display. You can change modes this way, even within a program. And, like ROM-View 80, Ultrascreen's documentation lists the necessary PEEKs and POKEs for controlling the enhanced screen from BASIC or machine language. The manual also lists a one-line BASIC program, SWITCH.BA, which can be run from the Main Menu to turn Ultrascreen on and off:

```
10 SCREEN PEEK(63032) XOR 1 :
   MENU
```

COMPATIBILITY BLUES

Most machine-language programs despise each other. And the screen enhancers are no exception.

ROM-View 80 is designed to be used only with Ultimate ROM II's applications; no crashes should be expected there. But how about Ultrascreen?

Ultrascreen works fine with most software, including FLOPPY.CO, ROMs such as SuperROM — and Ultimate ROM II, ironically — and with BASIC programs. However, it *can* conflict with some machine-language programs that reside in high memory.

There are two solutions; a simple one and a more complex one. The simplest solution is to un-install Ultrascreen when using another machine-language software. Un-installation is easy: Go into BASIC and type in a CLEAR statement; when Ultrascreen sees its RAM protection being removed, it un-installs itself automatically. (This results in the Model 100 application names being returned to upper-case.) Then, follow the other program's installation instructions. When you're ready to resume using Ultrascreen, CLEAR 0, 56610 and select USC100. from the menu again.

The other solution to the conflict program is more technical. Ultrascreen is relocatable; that is, its code can reside nearly anyplace in high memory. So, determine where your other machine-language program *must* reside, and relocate Ultrascreen to live underneath it. Ultrascreen's documentation contains the instructions for relocating the program, as well as the needed start and end memory addresses for Ultrasoft Innovation's word processor, Text Power 100.

Once your screen enhancer — either ROM-View 80 or Ultrascreen — is installed, you'll find that your BASIC programs will require very little modification to work with them. The biggest change needed will perhaps be in PRINT @ statements, since the character positions are now different. However, the documentation for both ROM-View 80 and Ultrascreen contains hints and suggestions for optimizing your software to work in the new environment.

A TOUGH CHOICE

All of the screen enhancers are excellent products, from Traveling Software's ROM-View 80 and standalone T-View 80 to Ultrasoft Innovation's Ultrascreen. And all will be useful for nearly every Model 100 or Tandy 102 owner.

ROM-View 80 offers a slightly larger character set, changeable screen widths — useful when formatting doc-

uments in TEXT — and a very handy "snoopy" TELCOM mode. On the other hand, it can't be used with other machine-language programs. It takes an extra step to go through the Ultimate ROM II to use BASIC, TEXT and TELCOM-80. And, it doesn't reproduce the high-order characters.

Ultrascreen's characters are smaller, but still easy to read, with a font editor, and the program works well with other programs. And, if the whole idea is to squeeze more text onto the screen, Ultrascreen's ten-by-60 display beats ROM-View 80's eight-by-60.

Traveling Software
19310 North Creek Parkway
Bothell, WA 98011
(800) 343-8080
(206) 483-8088 in WA
Ultimate ROM II, $299.85 (ROM)
T-View 80, $39.95 (Cassette only)
Circle No. 170

Ultrasoft Innovations
76 Main Street
P.O. Box 247
Champlain, NY 12919
(800) 448-4511
(800) 962-1480 in NY
Ultrascreen 100/102, $34.95 (Cassette and PDD Disk)
Circle No. 171

My choice as best screen enhancer is Ultrascreen. The "feel" of the product is that of the regular, unenhanced Model 100; it's very unobtrusive, not changing any menus, not requiring any extra steps. It's as automatic as a utility can be. And it does a good job, no frills, but no surprises either.

Ultrascreen is a product that, once I've used it, it'll be hard to live without. □

USE THE FULL POWER OF YOUR EPSON FX PRINTER
with
EPRINT.BA
FAST-POWERFUL
WORD PROCESSOR-FORMATTER-TYPESETTER
for Model 100/200 Computers
and Epson FX Printers

Use and mix any of the 88 Epson FX print modes with PRECISION FULL JUSTIFICATION, Left Justification, Center Justification or Right Justification.

COMPARE THESE FEATURES

- AUTOMATIC PAGE NUMBERING
- HEADERS AND FOOTERS
- AUTOMATIC INDENTATION
- AUTOMATIC CENTERING
- FORMATTING ON ANY SIZE PAGE
- LINE SPACING CONTROL TO 1/216"
- UNDERLINING
- ITALICS
- SUPERSCRIPTS AND SUBSCRIPTS
- DOUBLE STRIKING
- ADVANCE AND REVERSE PAPER FEED
- APPENDED PRINTING OF FILES
- MULTIPLE COPIES
- REPETITION OF CHARACTERS
- REPETITION OF CHARACTER STRINGS
- ACCESS DOWNLOAD CHARACTER SET

Over 150 printer and formatting commands can be given from control codes embedded in your TEXT file while you write.

$45.00 + $3.00 postage and handling
VISA AND MASTERCARD ACCEPTED — NEW MEXICO RESIDENTS ADD LOCAL SALES TAX

SUN BELT SOFTWARE
2313 N. Main #33, Las Cruces, NM 88001 — (505) 524-3798

Circle 67 on Reader Service Card

NEW!
For Model 100
NEC PC-8201

SafeSkin™ KEYBOARD PROTECTOR

Finally! A keyboard cover that remains in place during use!

SafeSkin prevents costly downtime and repairs due to liquid spills, dust, smoke, cigarette ashes, paper clips, staples and other environmental hazards. **SafeSkin** is made of ultra-thin, ultra-tough, clear flexible plastic, molded to fit every key and contour, allowing normal key response and feel. This custom fit cover is easily removed for cleaning and gives years of dependable service. Available for the **Model 100, NEC PC-8201, IBM PC, XT, AT, Apple, C64** and many other popular computer models. Send 29.95, Check or M.O., Visa & MC include expiration date. Specify computer type. Dealer inquiries invited. Free brochure available.

MERRIT COMPUTER PRODUCTS, INC.
4561 South Westmoreland / Dallas, Texas 75237 / (214) 339-0753

Circle 65 on Reader Service Card

Disk Operating Systems for the Model 100

There are a number of good alternatives.

by Thomas L. Quindry

There are several good disk operating systems on the market now for the Tandy Portable Disk Drive and similar drives used with the Model 100 and Tandy 102 and 200 computers. These operating systems are more convenient and much more capable than Tandy's FLOPPY.CO, which can hardly be called an operating system.

Program costs range from around $50 to $119. This may seem like a steep price to pay considering that the disk drive alone costs less than $200. But consider the extra versatility these operating systems offer and whether these enhancements are of value to you when using your computer. The Tandy 200 versions of these operating systems should behave similarly to the Model 100/Tandy 102 versions reviewed.

POWR-DOS

Powr-DOS from Acroatix is a resident machine language disk operating system with additional controller programs in BASIC. It occupies low RAM, meaning that it resides in some of the space normally occupied by a BASIC program, rather than the higher area of memory normally occupied by machine language programs. The BASIC controller program frees you from the tedium of remembering the many commands needed to use the operating system. Powr-DOS is about 3K long and the BASIC controller program is about 2.4K long.

Installation of Powr-DOS is simple. You can load a special BASIC loader with FLOPPY.CO. If you don't have FLOPPY.CO or any other operating system, you can type in the same short BASIC program, IPL.BA, that Tandy uses to load FLOPPY.CO. After running IPL.BA or Acroatix' special loader, PL.BA, Powr-DOS is loaded into the computer and installation begins.

Powr-DOS wants to be located as low in memory as possible. Powr-DOS's resident program will be placed in the first available position above unmovable BASIC programs, preserving the compatibility of programs that have to operate together. What the manual doesn't say is that all other inflexible programs must be installed first or else they'll move Powr-DOS when they are installed.

One of the main advantages of Powr-DOS being located in low RAM memory is that it won't conflict with running other machine language programs. Other than that, I am always apprehensive of resident programs while running other programs.

There is no way to make Powr-DOS inactive other than to remove it entirely from the computer system by a special command. This isn't too bad a solution; if you keep PL.BA in your computer you can load it in again easily, and without having to change DIP switches on the bottom of the disk drive as with IPL.BA.

Powr-DOS offers a powerful means to create BASIC utilities for accessing the disk drive. Most often this will be to read or write data to disk. You can also develop special-purpose programs. All

of the BASIC utilities supplied by Acroatix with Powr-DOS are, in fact, the same type of utilities that many users could write, given the information in the manual and a little ingenuity. This shows the versatility and power of Powr-DOS, but also means that operations you perform using them may be a little slower than with the other operating systems.

The main program is DMENU.BA. This program provides a view of the RAM directory or disk directory and allows several operations for saving, loading, or killing files, viewing files, or running files directly from DMENU. It allows you to select several programs and files at once for saving, loading, or killing. Files can be run directly from the disk or loaded into RAM and executed.

Powr-DOS includes an alternative program to DMENU called DOS+.BA. This program has several options that can be merged to it to increase functions (and size). It performs many of the same functions of DMENU but appears to do be faster and easier.

You can also format a disk by direct command from BASIC or from a program called FORMAT.BA. Disks can be backed up to either a cassette, with COPY-C.BA or to disk with COPY.BA. A handy feature: COPY will calculate and tell users how many disk swaps are needed, and allows users to change their minds about making a backup. COPY-C tells how long it will take to copy to cassette; a full disk will take about thirty minutes.

A program called D-TEXT.BA simplifies the manipulation of document files on disk. You can access a file directly from a disk, edit it and save it back to disk. The disk file can be up to 64K, much too long to fit into the Model 100. You can select which portion of the file you want in memory and after you edit that portion, save it back to disk even if it is in the middle of an existing file.

D-TEXT.BA also allows selection of a printing format, which can be either a stock item or your own specialized format. You can then print out your file to a printer. My only problem with the printing formats is that you must remember what you have set. There is no simple provision to preview what has been selected.

One of the best features of Powr-DOS is data recovery. If you have a disk that has been trashed (such as displayed error messages citing bad sectors or a non-existent directories), RECOVR.BA will search through the disk, sector by sector, and determine where whole programs or files are located. It then becomes a tool to determine whether the file is a BASIC program, a document or a machine language program.

After you've have identified the file sufficiently, you can save the file to another disk with a proper name and extension and then scan the damaged disk for the next file. If you accidentally kill a file, you also can get it back using RECOVR as long as you haven't written another file over what you just killed.

The manual includes a good description of commands that Powr-DOS adds to BASIC. These include commands to access the disk and provide information or transfer files. Powr-DOS has the best means of saving a program to RAM of all programs reviewed.

There is no way to uninstall Disk Power without cold starting the computer.

One very powerful command is DKSO$, which allows you to read or write to any sector on the disk. This is probably one of the primary commands for the file recovery program. There are a number of good chapters in the manual on how your disk drive operates and tips to aid you in programming with Powr-DOS for both BASIC and machine language.

Powr-DOS comes on a copy-protected disk, which is one of the main things I don't like about it. You can get an unprotected version by sending your disk and $5 to Acroatix. That, however, is a hidden cost of the program, and I feel that Acroatix should have included that in their price. By protecting the disk, however, Acroatix can give you the opportunity to return the program for a refund if you don't like it.

Powr-DOS seems to be the most versatile of the bunch reviewed here. If you're a programmer at heart, and want to unleash the full power of your Model 100 with a disk drive, than Powr-DOS may be for you.

DISK POWER

Ultrasoft's Disk Power is the least expensive of the group. It also has fewer features and some inconveniences. Installation requires either loading from cassette or another disk operating system. Disk Power requires that your computer have a full 32K RAM and also that its resident program be loaded at absolutely the lowest RAM position.

Disk Power occupies about 2.9K. It conflicts directly with programs that also need that special RAM location to run, like PG Design's expansion RAM transfer program, and cannot be used with it.

Disk Power seems to be incompatible with the PCSG expansion RAM with its bank transfer program. So if you have an expansion RAM, better forget about Disk Power. This was the only DOS reviewed here that cannot be used with these multi-RAM banks and their transfer programs.

To install Disk Power, you must go through certain manual steps that are automatic with Powr-DOS. While Powr-DOS will move an existing BASIC program to another location or else relocate itself, installation of Disk Power requires that no other BASIC program be in memory. After installation, you must manually kill the install program and reset the HIMEM pointer. You must also turn your disk drive off and then on again or else Disk Power cannot access it. All these actions don't create confidence in the program, since others can handle these types of things automatically.

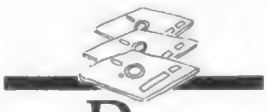
The Disk Power's program development team tried to pack as much information onto the screen as possible. This is a noble effort but it does leave the Model 100 display somewhat cluttered and busy looking. So much information is displayed that there's no room for a description of function key commands. A template is provided that can be cellophane-taped to your computer but it is obviously less than ideal.

All Model 100 RAM or all disk directory file names can be displayed on the screen at once, with filenames displayed five to a row. A small letter *b, c* or *d* added to the filename indicates BASIC, machine language or document

files. While looking at the RAM directory, there are two lines of reverse-video display information about the file highlighted by a reverse-video cursor. In BASIC, up to the first 80 characters of the first BASIC line are displayed in ASCII format. Machine language programs show the top, end and execution addresses. Document files display the first 80 characters of text.

On the bottom row is listed the amount of memory used by an unsaved BASIC program, the number of characters in the text paste buffer, the current value of HIMEM and the number of free bytes of Model 100 RAM. Two particularly dangerous function key commands are F1 for clearing the unsaved BASIC program and F7 for clearing the paste buffer. No "are you sure?" second chance is given. I'd rather they didn't offer that particular convenience.

You can select multiple files for transfer between disk and RAM or killing files, as with Powr-DOS. You do get a second chance for these commands by answering one of A/Y/N. The *A* stands for absolute execution of the command and the others are, of course, *Yes* and *No*. The *A* command is confusing because, depending on the function, it can mean different things. For killing files, *A* and *Y* mean the same thing; ditto for Formatting. For the list function, the *A* response lists to both the printer or screen while *Y* lists to the screen only.



Disk operations will cut off an existing phone connection.

From BASIC you can only load, merge or run a BASIC program that has been saved in ASCII format and only to the computer's RAM. As in all the programs reviewed here, data can be read and written to both RAM and disk files.

Disk Power allows you to return from TELCOM to BASIC or TEXT without losing your phone connection — something the other programs don't feature. From TELCOM users can see .DO files and free memory information. Programs can be saved to cassette from TELCOM, but not to disk unless you're using an acoustic coupler for your modem. Since the internal modem and RS-232 share the same RS-232 port, disk operations will cut off an existing phone connection.

There is no way to uninstall Disk Power from its resident state without cold starting the computer, which I consider bothersome. All in all, I didn't care much for Disk Power's shortcomings, especially its inflexibility and incompatibility with other programs, rather than its many abilities. It also comes on a protected disk.

TS-DOS/TS-RANDOM - DISK VERSION

TS-Random from Traveling Software, which includes TS-DOS, is really a separate program that is an extension to TS-DOS. Many of TS-Random's advertised functions are actually functions of TS-DOS. Both TS-DOS and TS-Random have RAM-resident portions for programming support and non RAM-resident portions which are simply machine language programs that require no installation.

The RAM-resident portions are the easiest to remove and reinstall of all these operating systems. You just load either program and hit the function key which toggles that particular DOS on or off. You can also turn the resident DOS off with a call from BASIC. The TS-DOS and/or TS-Random programs still remains in the directory even though nothing is left active.

The separate TS-Random program provides four main functions: disk copy, disk format, random recovery and disk file recovery. The resident portion of TS-Random allows data storage and retrieval to disk in a random access fashion.

The RAM-resident portion of TS-Random is where all the real work takes place. You must write BASIC programs to use the random-access functions. A sample program called FILER.BA is included to illustrate the random access functions. A similar program named SAMPLE.BA illustrates the TS-DOS-related functions. Depending on what you plan to do from a BASIC program, you would have either the resident portion of TS-DOS (for sequential data files) or TS-Random (for random access data files), but never both. For random access operations, the disk must be especially formatted by TS-Random and the entire disk dedicated to data files.

The disk-copy function formats the target or backup disk exactly to match the original source disk. It will only copy standard or TS-Random formatted disks, however. Copy-protected disks such as provided by Powr-DOS and Disk Power cannot be backed up using TS-Random. The TS-Random master disk isn't copy-protected and thus can be backed up.

File recovery does about the same thing as Powr-DOS except that the file recovered is saved to a RAM file first rather than directly to another disk. The file recovery program within TS-Random is easier to use and more straightforward than that of Powr-DOS. You can recover data on a disk that has been formatted especially for random disk access in addition to regularly formatted disks.

When formatting blank disks with the other operating systems, you must stay with disk sector sizes of 1,280 bytes. TS-Random allows formatting for 64, 80, 128 or 256-byte record lengths. A 64-byte record length provides 1,600 records per disk. (An 80-byte record length figures to 1,280 records, an so on.)

A TS-Random formatted disk can only be read by the TS-Random program at this time. It cannot be read by TS-DOS or the other operating systems currently available and is strictly for storage and retrieval of data. If you need the capability of random data access, TS-Random is the only game in town at this time.

TS-DOS has been improved from the original program, with added functions to tag files for multiple operations for saving, loading and killing. A few small bugs were also corrected. Loading by using IPL.BA is also now included so no other operating system is required to get the programs off of disk. TS-DOS takes up a little more than 5K, but when not in use a 532-byte loader program is all you need to load and run it. You can also load and run it from Traveling Software's high-powered multiple-function ROM, Ultimate ROM II.

TS-Random itself takes up 4.8K but additionally must be run directly from a storage location in RAM. Thus twice as much RAM memory needs to be free. When you get down to using TS-DOS or TS-Random in their resident modes, about 2.7K to 2.9K is needed. The manual states that 6,500 bytes free are

needed to operate both TS-DOS and TS-Random off of disk.

The resident portion of TS-DOS is not as versatile as Powr-DOS in its DOS commands available from BASIC, but is better than those of Power Disk. Files cannot be saved directly to RAM from disk but go to their operating locations like Power Disk.

Since TS-DOS is located in high memory, the BASIC LOADM command for machine language programs is virtually useless since it would in all probability overwrite part of the resident disk-operating system. From BASIC, you can only load, merge or save BASIC programs and load or save machine language programs to their operating locations. The BASIC programs don't need to be saved on the disk as ASCII files as they do with Disk Power.

Powr-DOS
Acroatix
10 Upton Drive
Wilmington, MA 01887
(617) 658-5550
For the Model 100,
Tandy 102 and 200
$69.95
Circle No. 240

Disk Power
Ultrasoft Innovations
P.O. Box 219
Ste. Anne de Bellevue,
Quebec H9X 3R9
Canada
(514) 457-9293
For the Model 100,
Tandy 102 and 200
$49.95
Circle No. 241

TS-DOS/TS-Random
Traveling Software
19310 North Creek
Parkway
Bothell, WA 98011
(206) 483-8088
For the Model 100,
Tandy 102 and 200,
NEC PC-8201
TS-DOS Disk $69.95
TS-Random Disk $89.95
TS-Random ROM
$119.00
Circle No. 242

THE ROM OPTION

The ROM version of TS-DOS/TS-Random offers some distinct advantages over the disk version. First of all, the ROM version uses less than 300 bytes of user RAM when running programs from ROM. The resident portions of TS-DOS and TS-Random, for use with BASIC or TEXT, take no user memory and run from the ROM. Thus the ROM version saves anywhere from 2.7 to 5K of precious Model 100 memory over the other operating systems, including disk-based TS-DOS and TS-Random.

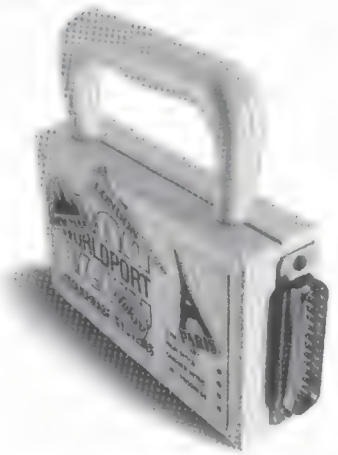
The ROM version has other functions not available with the disk version. While in TS-DOS from ROM, you can compress document files 30 to 40 percent. These files then have a .DP or .DC extension rather than the .DO extension. Compression or expansion takes place only on RAM files — but files can be saved to disk in the compressed form.

Another other nice feature available as an extra on the ROM version is an easy way to recover files should your computer be accidentally cold started. While TS-Random ROM is in the computer, a simple CALL from BASIC will create a text file comprising all user RAM. You can then delete unreadable BASIC and machine language characters from this text file. Then use the cut-and-paste utilities in the Model 100 to extract pieces of text to place in separate files.

Of these three operating systems for the Model 100, my favorite is the TS-DOS/TS-Random programs. You can buy TS-DOS as a separate program on disk if you don't need random access. The TS-DOS part of the programs from Traveling Software are the most user-friendly of the bunch and the commands are easy to learn.

As far as capabilities go, I'd have to go along with Powr-DOS. This program has the most flexibility (except for no random access) in its command set. It is harder to learn and easier to forget the commands if you use your Model 100 infrequently. Since all of the Powr-DOS utility programs are written in BASIC, operation is somewhat slower. Using these BASIC programs as a guide, though, you have a good basis for creating super utilities. □

THE MODEM FOR PEOPLE WHO TAKE THEIR ACT ON THE ROAD.



When you travel with your portable computer, make sure your communications go with you. The WorldPort 1200™ Portable Modem is the only modem you need, whether you travel across the country or around the world.

While most portable computers offer an optional modem of some type, only the WorldPort 1200 gives you all the features required for true portability. Features like battery-powered, Hayes™ Command Set compatibility, Bell and CCITT standards, direct and acoustic cups interface for 300 and 1200 bps, and compact size.

Equally at home on your desktop, the WorldPort 1200 works with virtually any computer with a RS-232C serial port. No more of those dedicated internal modems that can only be used with one computer.

The WorldPort 1200. At only $199, you can't afford to leave home without it.

For more information or your nearest dealer, contact us today.

TOUCHBASE SYSTEMS, INC.
16 Green Acre Lane
Northport, NY 11768
(516) 261-0423
Telex 6502848020

Hayes is a registered trademark of Hayes Microcomputer Products Inc

Circle 53 on Reader Service Card

YOU BE THE EDITOR

Every reader has unique needs. Some seek guidance from reviews of software and peripherals. Others look to a magazine to provide tips to increase their programming proficiency. Accounts of innovative applications attract a big audience, as do articles about other users who find creative ways to use their systems.

You can help tailor **Portable 100** to your unique needs by rating the articles that appeared in this issue. Just circle the numbers indicated below on the Reader Service Card at left. Rate all the articles, some of them or just one. Then detach the card and drop it into the mail — we pay the postage.

The editors will analyze your feedback and respond by commissioning more articles of the most popular types — and fewer of the losers.

Tandy's New Dandy
The MS-DOS Tandy 1400 LT.
(page 8)
Excellent 200
Good 201
Poor 202

Born to Communicate
Overview of communications.
(page 12)
Excellent 203
Good 204
Poor 205

Build Your Own Spike Protector
Protection from phone lines.
(page 17)
Excellent 206
Good 207
Poor 208

Tandy 600 Communications
Understanding the Tandy 600.
(page 21)
Excellent 209
Good 210
Poor 211

Watching the Big Screen
Review of screen enhancers.
(page 24)
Excellent 212
Good 213
Poor 214

Disk Operating Systems
A comparative review.
(page 28)
Excellent 215
Good 216
Poor 217

Utility Corner
Guitars and word counting.
(page 34)
Excellent 218
Good 219
Poor 220

Prints and The Pauper
Review of a print utility.
(page 36)
Excellent 221
Good 222
Poor 223

The Printer Alterative
Choosing a portable printer.
(page 40)
Excellent 224
Good 225
Poor 226

OVERALL QUALITY OF THIS ISSUE

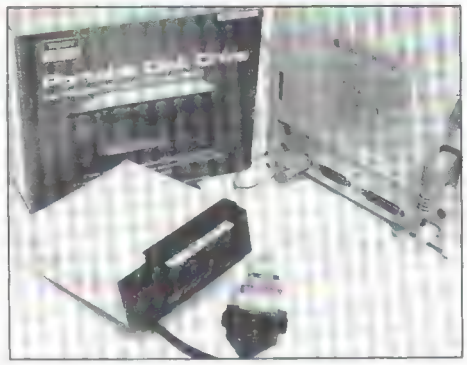
Excellent 227
Good 228
Poor 229

ADVERTISERS INDEX

Free Information

For free information on products advertised in this issue of *Portable 100,* locate the Reader Service number corresponding to the advertisement that interests you. Circle the number on the card at left and drop it into the mail. The literature you've requested will be forwarded to you without obligation. Please allow 3-5 weeks for delivery.

Reader Service No.	ADVERTISER	Page Number
62	Covington Group	38
—	CD ROM Review	13
—	80 Micro	1
65	Merritt Computers	27
40	P.C.S.G.	CIV
52	P.C.S.G.	37
71	P.C.S.G.	5
75	P.C.S.G.	47
63	Peptone Software	22
43	PG Design Electronics	CII
—	Portable 100	16
66	Portable Power	19
50	Portable Programs	14
74	Purple Computing	39
61	SIAS	22
70	Sigea Systems	23
60	Simons Products	38
76	Soundsight	15
64	Stradivarius Software	19
67	SunBelt	27
42	Tandy	7
53	Touchbase Systems	31
41	Traveling Software	48
77	Traveling Software	CIII
15	Traveling Software	33
78	Ultrasoft	20
—	University Microfilms Int'l	43



Wonder how you get from here to there?

The first integrated Macintosh to laptop file transfer solution.

If you have a laptop computer and a Tandy or Purple Computer portable drive, your Macintosh is just a click away! **MacDOS** gives your Macintosh the power to access the portable drive quickly and easily.

Manage your Data

With **MacDOS**, your Macintosh can read and even edit files created with your laptop. You can Open, Edit, and Print files on the portable drive as easily as regular Macintosh files. **MacDOS** even has a Copy All command that can copy all of your files from the portable drive to the Macintosh for easy backups.

FEATURES

- Full editing capabilities for files less than 43K in size
- up to 4 file windows open at a time
- catalog window shows files on the portable drive

PRICING

MacDOS and adapter $95

No Messy Cables

MacDOS comes complete with adapter cable and software. All you do is plug the portable drive into the Macintosh via the special **MacDOS** adapter cable*.

MacDOS is easy to use.

Like all great Macintosh software, **MacDOS** is easy to use. **MacDOS** gives you quick access to the data you want, when you want it.

Best of all . . .

MacDOS is available NOW.
Call toll free to have Traveling Software give your Macintosh **MacDOS**: the connection to the portable drive.

*To order **MacDOS** call toll free:*

1 800 343-8080

Or write: **Traveling Software**
North Creek Corporate Center
19310 North Creek Parkway
Bothell WA 98011
(206) 483-8088

MacDOS

Circle 15 on reader service card.

TRAVELING SOFTWARE®

Traveling Software is a trademark of Traveling Software, Inc

Macintosh is a trademark of Apple Computer, Inc
MacDOS is a trademark of Traveling Software, Inc
1986, 1987 Traveling Software, Inc

*Macintosh Plus owners will need the Mini-8 to DB9 connector cable to use MacDOS

The Right Tune

When I priced electric tuners for my guitar and ukulele, I was shocked, to say the least. They were untouchable. There was no way I could afford both a tuner and the ROM chip I had been planning to buy.

So I got to thinking. If I could duplicate a tuner using my Model 100, then I could afford that ROM chip.

It's certainly more pleasant to listen to stringed instruments that are tuned properly. Tuning can be — and often is — accomplished in a haphazard fashion beginning with a string that you *think* is correct, then tuning the other strings to a pitch relative to that first string. This works to a fair degree if your first guess was somewhat accurate.

One problem with this method, however, is that instruments containing frets are designed to incrementally shorten the string while chords are made, and this is based on a properly tuned string. Although the open strings may be in tune relative to the first string, the higher chords will be slightly out of tune.

And then comes the day you change strings or the instrument gets hopelessly out of tune. If you're like most of us and lack perfect pitch, some assistance is needed — a pitch pipe, mechanical tuning reeds, electronic tuner or a Model 100.

The accompanying program uses the frequency generator capability of the Model 100 to produce the needed notes for tuning. Since my collection of instruments consists of an antique bass viol, a banjo ukulele and a guitar, I decided to write a multipurpose tuning program.

The standard guitar program serves for both guitar and bass, which uses strings three through six for the guitar. As a student of Hawaiian slack key (kiho' alu) using an "open D" tuning, I included that tuning as well.

At just under 1,500 bytes, this program is small enough to stay in RAM, ready for use — and now I'm able to afford that ROM I wanted.

— Terry Sargent

TUNE.BA, a program for tuning guitars and ukuleles.

```
10 CLS
 :PRINT @81, "TUNING PROGRAM FOR GUITAR AND UKULELE"
 :PRINT ""
 :PRINT ""
20 INPUT "If for guitar enter <g>, ukulele <u>"; I$
30 IF I$="g" THEN 160
40 IF I$="U" THEN 310
50 MENU
60 CLS
 :GOTO 430
70 CLS
80 PRINT @42, "Tuning Program for Guitar"
90 PRINT @122, "String#"
 :PRINT @130, "6"
 :PRINT @135, "5"
 :PRINT @140, "4"
 :PRINT @145, "3"
 :PRINT @150, "2"
 :PRINT @155, "1"
100 PRINT @162, "Note"
 :PRINT @170, "E"
 :PRINT @175, "A"
 :PRINT @180, "D"
 :PRINT @185, "G"
 :PRINT @190, "B"
 :PRINT @195, "E"
110 PRINT ""
120 INPUT "Which string (<0> if done)"; S
130 IF S=6 THEN SOUND 7456,200
140 IF S=5 THEN SOUND 5586,200
150 IF S=4 THEN SOUND 4184,200
160 IF S=3 THEN SOUND 3134,200
170 IF S=2 THEN SOUND 2488,200
180 IF S=1 THEN SOUND 1864,200
190 IF S=0 THEN MENU
200 GOTO 180
310 CLS
320 PRINT @42, "Tuning Program for Ukulele"
330 PRINT @122, "String#"
 :PRINT @130, "4"
 :PRINT @135, "3"
 :PRINT @140, "2"
 :PRINT @145, "1"
340 PRINT @162 PRINT @162, "Note"
 :PRINT @170, "A"
 :PRINT @175, "D"
 :PRINT @180, "F#"
 :PRINT @185, "B"
350 PRINT ""
360 INPUT "Which string (<0> if done)"; S
370 IF S=4 THEN SOUND 2793,200
380 IF S=3 THEN SOUND 4184,200
390 IF S=2 THEN SOUND 3321,200
400 IF S=1 THEN SOUND 2488,200
410 IF S=0 THEN MENU
420 GOTO 320
430 INPUT "Enter the proper key for type of tuning
    <s> for  standard ...(insert 24 spaces)...<h>
    for Hawaiian slack key"; X$
440 IF X$="s" THEN 170
450 IF X$="h" THEN 470
460 MENU
470 CLS
480 PRINT @42, "Tuning for Hawiaan Slack Key Guitar"
490 PRINT @122, "String#"
 :PRINT @130, "6"
 :PRINT @135, "5"
 :PRINT @140, "4"
 :PRINT @145, "3"
 :PRINT @150, "2"
 :PRINT @155, "1"
500 PRINT @162, "Note"
 :PRINT @170, "D"
 :PRINT @175, "G"
 :PRINT @180, "D"
 :PRINT @185, "G"
 :PRINT @190, "B"
 :PRINT @195, "D"
510 PRINT ""
520 INPUT "Which string (<0> if pau)";S
530 IF S=6 THEN SOUND 8368,200
540 IF S=5 THEN SOUND 12538,200
550 IF S=4 THEN SOUND 8368,200
560 IF S=3 THEN SOUND 6269,200
570 IF S=2 THEN SOUND 4976,200
580 IF S=1 THEN SOUND 2092,200
590 IF S=0 THEN MENU
600 GOTO 480
699 END
```

Ten Cents a Word

Illogical as it may be, life is measured by the word — at least if you're a writer. College essays: "500 words by Monday." Newspaper columns: "Ten cents a word." Even magazines: "A cover story is 3,000 words."

It's a shame that computers don't use the word as a basic measurement. But they don't — they use bytes, or individual characters. Here at *Portable 100*, we work in bytes, talking about a magazine page being 5K, or 5,000 characters. But with non-technical authors, "5,000 characters" doesn't cut it.

Some software, like most of the ROM-based word processors, include a word counting function. But if you use some older programs, or just the Model 100 or Tandy 200 TEXT function, you'll have no idea how long your Great American Novel is.

That's the reason for WORD.BA, my quick-and-dirty word counter. It's not fast and it's not elegant, but it does count the number of words in a .DO file.

First, I defined a word as being something which begins with a non-blank character, and ends with either a carriage return or a blank. That means that if your documents include embedded dot-commands, they'll be counted as words.

Don't bother giving an extension when prompted for the file name — WORD.BA ignores it.

Four variables are the keys to the word counting: RC$, a stream of characters read in from the document file; CT, which moves along the length of RC$; WC, the number of words counted; and BL, which signals the end of a word.

To begin with, WC and BL are set to zero, to indicate that no words have been counted, and that the first non-blank character encountered will begin a new word.

A line from the document is read into RC$. The counter CT moves across the length of RC$. If it encounters a blank character, the variable BL is set to zero. But if the character pointed to by CT is non-blank, BL is examined. If BL is equal to zero, that means that a new word is starting — and BL is set to equal to one, and WC is incremented by one. If BL was equal to one, though, that means that the character is in the beginning of a word, and therefore no action should be taken. It's simple and straightforward, actually counting the transitions from blank to non-blank characters.

A brief word about line 400: The LINE INPUT statement operates in two ways. If a logical record in a document file (a paragraph) is shorter than 255 characters, the entire record is read into RC$. Testing to see if the length of RC$ is less than 255 checks to see if the data read ended in a carriage return. If the length of RC$ is equal to 255, then the string variable contains only *part* of a paragraph — and a word could be broken between one LINE INPUT statement and the next. By only forcing the end of a word at the end of a paragraph, the IF statement in line 400 prevents errors in word counting in long paragraphs.

If your document contains embedded dot commands (lines that signal special codes to word-processing software, and begin with a period in column one), and you want to modify WORD.BA *not* to count these, add a line to the listing:

```
341 IF BL = 0 AND LEFT$(RC$, 1) = "."
    THEN 330
```

That will tell WORD.BA to completely ignore lines that begin with a period.

—Alan L. Zeichick

WORD.BA, a word-counting program for the Model 100, Tandy 102 or Tandy 200.

```
100 ' Word Counter
110 ' Alan L. Zeichick, Portable 100
120 '
130 PRINT "Word Counter"
140 PRINT
150 PRINT "Which document?"
160 PRINT "Press Enter for Menu."
170 INPUT NA$
180 IF NA$ = "" OR NA$ = "Menu" THEN MENU
190 IF INSTR(NA$, ".") > 0 THEN NA$ = LEFT$(NA$,
    INSTR$(NA$, ".") - 1)
200 ON ERROR GOTO 450
210 OPEN NA$ + ".DO" FOR INPUT AS #1
220 CLS
230 PRINT "Opened file "; NA$
240 WC = 0
250 FL = 0
260 BL = 0
270 PC$(0) = CHR$(27) + "p"
280 PC$(1) = CHR$(27) + "q"
290 '
300 ' Set up for "infinite" loop
310 '
320 PRINT @ 81, PC$(FL); " Reading data... "
330 FL = 1 - FL
340 LINE INPUT #1, RC$
350 '
360 FOR CT = 1 TO LEN(RC$)
370   IF MID$(RC$,CT,1) = " " THEN BL = 0 ELSE IF
      BL = 0 THEN BL = 1:WC = WC + 1
380   NEXT CT
390 '
400 IF LEN(RC$) < 255 THEN BL = 0
410 GOTO 300
420 '
430 ' Error handling
440 '
450 IF ERR = 54 THEN PRINT @ 81, PC$(1); "The
    document contains"; WC; "words." ELSE PRINT "@
    81, PC$(1); Bad file name or file not found."
460 PRINT "Press any key for menu"; INPUT$(1)
470 MENU
```

The Prints and the Pauper

By Alan L. Zeichick

I don't ask much from my trusty Model 100. My needs are fairly limited: Writing BASIC programs, testing review software and keeping notes while on the road. I've rarely bothered to load commercial software into my laptop for my own use.

Come to think about it, I should have put *word processing* on the above list. I like the way that the Model 100 TEXT program works, and I've written many articles on the 100, both at home, on trips or sometimes in the office. After an article's written, I dump it into my high-powered Tandy 3000 desktop computer, using the RS-232 or sometimes the modem cable.

One thing that I *don't* do very often with my portable is print. I don't even have a printer cable for my Model 100 — when I need to print, I borrow one.

Nonetheless, sometimes I *do* need to print something from my Model 100. And that's where the built-in software lets me down, since I'm used to such niceties as page break and left-hand margins, not to mention double-spacing. I also, as a rule, print in Elite (12 characters per inch), and I like to be able to tell my printer, which defaults to Pica (10 cpi), to change fonts.

Enter SPRINT, the $19.95 universal print driver from Peptone Software. If you use your Model 100 the way I use mine, SPRINT might be all the software you need.

BASIC NEEDS

SPRINT is a stand-alone machine-language (.CO) program that handles basic print formatting.

In the simplest situation, running SPRINT brings up a three-option menu: Modify settings, Print a file, Exit the program. Pressing *M* for Modify tells the program to prompt you for several important choices:

Measure is what Model 100 TEXT calls *Width*. If you want your column of pica type to be six inches wide, you want a width or measure of 60.

Page size is the number of lines to print on a page before transmitting a form-feed character, ASCII 12. The average sheet of paper is 11 lines long, at six lines per inch, for a total of 66 possible lines; the standard is to use either 54 or 55 of them. A problem is that SPRINT figures that it's okay to end a page with a form-feed character — but some older printers, such as the Radio Shack DW-II and DWP-410, simply don't recognize the form feed. In those cases, you'll print right over the page perforation.

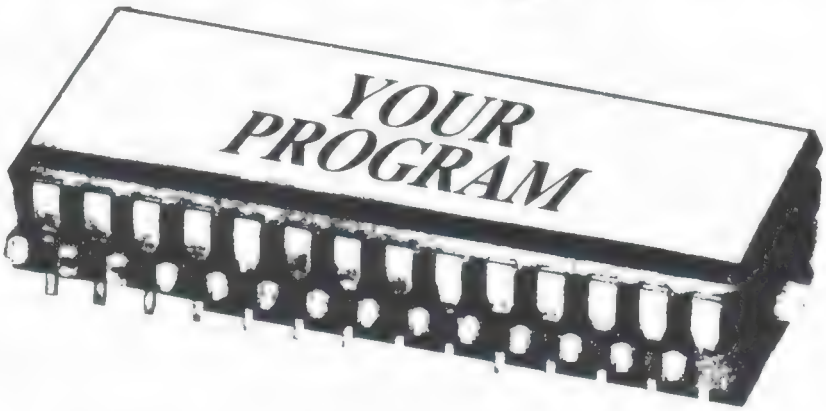
Line spacing gives you a choice of single or double-spaced text.

Indent is the distance from the printer's absolute left margin at which to start printing.

Line feed solves the dreaded line-feed problem. Some older printers expect both a carriage return (ASCII 13) and a line feed (ASCII 10) at the end of each line; some need only a carriage return, and automatically generate the line feed internally. SPRINT is able to print correctly on both types of printers.

Output port is normally parallel — but you can tell SPRINT to print to the

Your own Program on a ROM



8K or 32K
Your BASIC or machine code program on a custom ROM ready to snap into your Model 100, Tandy 102 or Tandy 200.
You can't tell your program from a built-in. Starting at $50.00 each. Minimum order of 10. Quantity pricing as low as $15^{00}

PORTABLE COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. No. 207, Dallas, Tx. 75229

1-214-351-0564

VISA / MASTER CARD / C.O.D.

Circle 52 on Reader Service Card

serial port if that's the type of printer that you have.

THAT'S NOT ALL

But those are global, document-wide choices. You can override these menu choices at whim by embedding special codes into your document — and you can achieve a few special effects.

Many print formatters use dot commands, which are codes which must appear on a line by themselves. SPRINT doesn't; instead, it uses bracket commands, such as [L01], that can be anywhere in the text. These include:

L sets the line spacing. You can therefore have some single-spaced and some double-spaced text in a document.

M changes the measure, so you can have some narrower paragraphs.

I changes the left indent value. By changing *I* and *M* together, you can put the text any place you want.

RL gives you ragged left text — that is, text where the right margin is straight, but the left margin varies according to the number of characters actually on a line. *RR* returns you to the more normal ragged right text mode.

An extra that SPRINT gives you is the ability to customize the defaults for almost all of the above option settings. What you're actually doing is creating a new version of the SPRINT program, with new values. The brief, yet thorough, photocopied documentation explains the process well.

SPRINT comes close to solving all of my print-formatting needs. But there are a few features that it doesn't have that I'd like to see.

SPRINT.CO
Peptone Software
10112 Ebenshire Court
Oakton, VA 22124
$19.95
Circle No. 180

NOT EVERYTHING

How about easy-to-use underline, bold, italics or other font-changing function? SPRINT does provide an ASCII-code function, [D*nn*], that lets you dump escape and control codes to the printer. But how about using Grph-U for underline, Grph-B for bold, Grph-I for italics and Grph-N for return to normal? Granted, that would blow the "universality" of the print formatter, since the codes for these different features vary from printer to printer — but that could be handled with a code set-up screen.

Also, how about force-justified text? Some people like to have straight left *and* right margins, and that's not that difficult to program.

What I'm trying to say is SPRINT won't replace any of the high-powered ROM or cassette-based word processing or print formatting programs. But if you have limited print formatting needs that exceed those built into the Model 100, a $19.95 Universal Print Driver might be the tool for you.□

TRAVEL CASE PLUS+
MAKES YOUR LAPTOP PARTS A PORTABLE SYSTEM

- Unzip case, adjust typing easel, turn on switch and begin work
- The Tandy 102 or 200 can remain connected to your disk drive
- Navy blue padded nylon case and plastic tray protects equipment
- Large front pocket will hold a TTXpress or Diconix 150 Printer
- Dimensions: 12.5" x 14" x 2.5"

Tray also fits:
- Model 100
- NEC 8201A
- Chipmunk Drive

Case without tray holds:
- NEC Multispeed
- Toshiba 1100+

SIMONS PRODUCTS
10908 GLEN WILDING LANE
BLOOMINGTON, MN 55431
PHONE (612) 881-7221

Travel Case+ $85.00 • Case w/o tray $70.00
Return within 15 days if not satisfied.
Check, Money Order, Visa, M/C
(Minnesota residents add 6% sales tax).
We pay postage in Continental U.S.A.

Circle 60 on Reader Service Card

LAPTOP Word Processor
M-100, 102, 200, NEC 8201A
More than 45 features, yet only 3345 bytes long. Lightning fast — runs at 5,000 cps. Graph Mode, Mail merge, numbering, works on any printer.
Only $**19.95** × 2.50 S&H
(Limited time at this low price)

Keyer
M-100, 102, 200, NEC-8201A
Lets you move keys to any position on the keyboard. Excellent for Dvorak keyboard conversions.
$**19.95** × 2.50 S&H

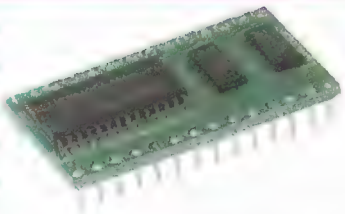
RAM Pack
M-100, 102, 200, Olivetti M-10, NEC-8201A
Store up to 50% more text without adding RAM. You can actually stuff more into your computer by using RAM Pack. Machine language, relocatable, 529 bytes.
$**29.95** × 2.50 S&H

To order, send check, money order or your VISA/Master Card number & expiration date. Phone orders accepted.

THE COVINGTON GROUP
4519 Perry Ave N.
Minneapolis, MN 55422
Call 612-537-4910

Circle 62 on Reader Service Card

EXPANSIONS!!!

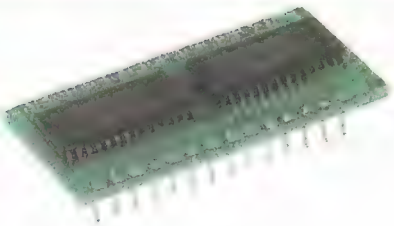


MODEL 100/NEC PC-8201A
8K Memory Module
$23—three or more $19 ea.

Easy to install. Open the case and plug-them-in. Each module expands your memory by 8K bytes. Extra low power components mean long battery life. Very low profile means a proper fit in the NEC PC-8201A. Detailed instructions make installation quick and easy. You can expand your Model 100 to 32K and your PC-8201 to 64K (2 banks of 32K each).

NEW!!!
MODEL 102
8K Memory Module
only $9.95

Easy to install. Just open the hatch and plug it in.



TANDY 200
24K Memory Module
$65—two for $59 ea.

Simply pop open the hatch with a coin and plug in one or two of these modules. Each module adds a 24K bank of memory to the TANDY 200. It's like getting two more machines. The built in COPY function key copies files between banks instantly. Like our 8K, we build these with the lowest power and most reliable memory chips available.

THE PURPLE POLICY

Try any of our products for 30 days, satisfy yourself that our service, quality, and prices add up to the best value anywhere—if not completely satisfied, you can return the product for a full refund. Prices include UPS surface shipping (in Continental USA)—even the phone call is free.

30-day money-back guarantee.

IT'S EASY TO ORDER

Send your order with payment to the address below. Or, if you prefer, credit card orders can be handled by phone—VISA, MasterCard, and American Express are welcome. California residents add 6% sales tax. Checks allow 3 weeks to clear.

1-800-732-5012 TOLL FREE
Orders only (8am—5pm PST)

(805) 987-4788 In California
For orders or customer service

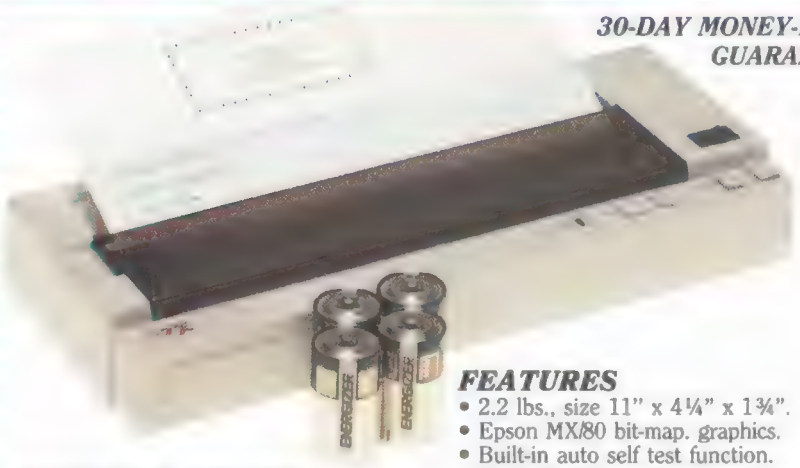
PURPLE COMPUTING

420 Constitution Ave.
Camarillo, CA 93010

Telex: 888661 (PURPLE)

Canada: Canada Portable Computer, (604) 534-6441
Australia: Softech Computer Services, (2) 419-8899

PORTABLE PRINTING



30-DAY MONEY-BACK GUARANTEE

MADE FOR TRAVEL

SIZE and WEIGHT are the most important considerations when going portable. This printer is half the size of the Model-102 and weighs only 2.2 lbs.

RUGGED

Because it's thermal, there are no ribbons, no ink, no pins to wear out or replace, all you need to take with you is paper.

FEATURES

- 2.2 lbs., size 11" x 4¼" x 1¾".
- Epson MX/80 bit-map. graphics.
- Built-in auto self test function.
- 8½" wide thermal paper.
- Excellent User's Manual.
- 40/80/160 chars./line, 40 chars./sec.
- 512 byte text buffer.

(ACTUAL print sample)
80 Chars/Line, 40 CPS!
Enlarged!
underlined Emphasized!
CONDENSED gives you 160 chars. per line!

$99 GRAND TOTAL

Includes a 20' roll of paper, four "C" batteries, and a custom-made 18" cable for your computer's parallel printer port. (Please specify computer make and model.) You get everything you need to start printing immediately!

IT'S EASY TO ORDER

Send your order with payment to the address below. Or, if you prefer, credit card orders can be handled by phone—VISA, MasterCard, and American Express are welcome. California residents add 6% sales tax. Checks allow 3 weeks to clear.

1-800-732-5012 TOLL FREE
Orders only (8am—5pm PST)

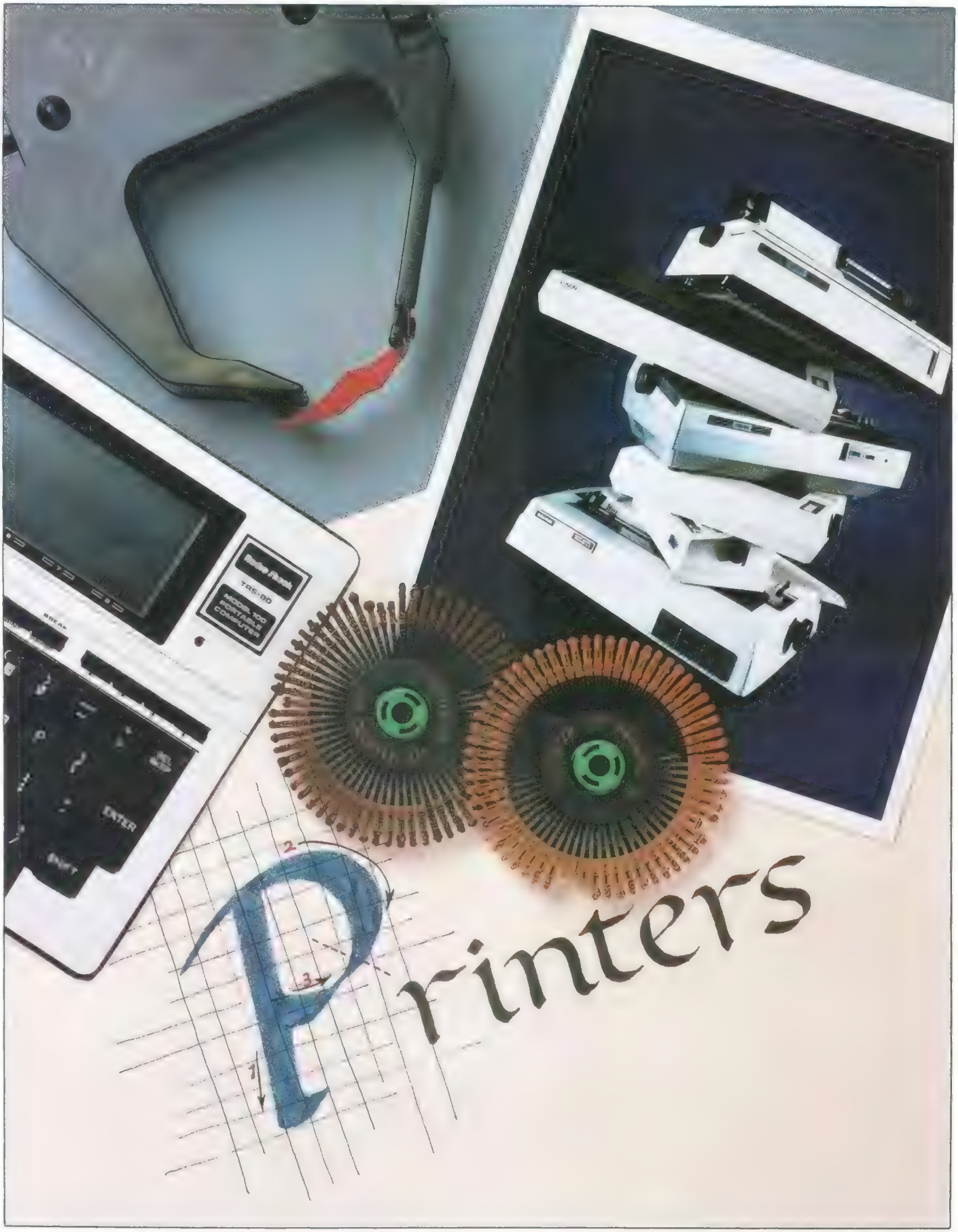
(805) 987-4788 In California
For orders or customer service

PURPLE COMPUTING

420 Constitution Ave.
Camarillo, CA 93010

Telex: 888661 (PURPLE)

Canada: Canada Portable Computer, (604) 534-6441
Australia: Softech Computer Services, (2) 419-8899


TRS-80
MODEL 100
PORTABLE
COMPUTER
ENTER
SHIFT
Printers

Weighing the Printer Alternatives

By Alan L. Zeichick

Do you remember the old Western Union Model 33 teletype machine? That wonder of technology printed upper case characters, number and punctuation at about eight or 10 characters per second, and cost several hundred dollars.

And the old Model 33 is still in use today. So are its descendants: the common desktop and portable printers that are found next to nearly every personal computer.

Except on computer systems used for computer-aided design or data entry, one printer per workstation is a must. However, as the prices of computers are coming down faster than the prices of printers, and with the growing number of options on the market, choosing a printer becomes a more important decision to make.

For a portable computer owner, choices abound. Battery or AC powered? Ink or thermal ribbon, or ink jet? Solid or dot-matrix character? Let's explore these choices by discussing printer technology and terminology. Like every other type of product, printers carry their own terms and jargon.

The single most important attribute about a printer is its *print type*. The most common print types are *solid character, dot matrix* and *laser print.*

Solid character printers, often called *daisywheel* printers, provide the highest quality printed copy. A solid character printer works the same way as an electric typewriter: When the printer is instructed to print the letter *A,* a plastic or metal model of the letter strikes a film or fabric ribbon, making an impression on the paper. The models of the letters are often molded onto a flat plastic disk that looks like the petals of a flower, hence the name daisywheel.

Solid character printers are ideal for the business executive who needs to print perfect-looking proposals and business correspondence. The drawbacks of solid character printers are that the multitude of moving parts makes the printer slow — between 10 and 40 characters per second — and these printers are usually larger, heavier and more expensive than dot-matrix units.

The second and most common category of printer, dot-matrix, is the least expensive printer technology. Pioneered by Epson America, the microcomputer dot-matrix printer uses a series of movable pins to create an impression of each letter or number. Because no physical model for each character exists, dot-matrix printers are incredibly versatile. Newer models can print several type sizes and styles as well as newspaper-quality pictures. Unfortunately, the traditional output from a dot-matrix printer isn't suitable for business correspondence. However, a new feature of many dot-matrix printers is a near-letter quality mode, or NLQ. This mode tells the printer to print each line two or four times, and the results are remarkable.

Dot-matrix printers are also relatively light weight and fast. An AC-powered dot-matrix printer should print at least 120 characters per second (cps) in its "draft" or low-quality mode, and at least 30 cps in NLQ mode.

Two sub-breeds of the common dot-matrix printer are the thermal and ink-jet printers. Both use the same logical method for creating characters, but the print mechanism is different. The thermal dot-matrix printer uses a group of tiny resistors instead of moveable pins; the resistors heat up and cool off very quickly, leaving marks on heat-sensitive paper or activating thermal-transfer ribbons. Ink-jet printers squirt droplets of ink from tiny nozzles. These two types of print technologies are common to battery-powered units, as the lack of moving pins makes the printer very quiet and the unit requires little power for operation. A drawback to thermal technology is that special thermal paper is required — and thermal paper deteriorates rapidly and is unsuitable for business documents.

Laser printers are the "new kid" on the printer block. Based on photocopier technology, laser printers are actually very high-resolution dot-matrix units. Often costing thousands of dollars, a desktop laser printer is most effectively used when shared between several computer users. Laser printers are very fast — measured in pages per minute — and quiet.

Once the question of print technology is answered, several other decisions need to be made. If the printer is going to be used for advanced applications such as graphics, the printer should adhere to one or another of the industry standards.

In the early days of personal computer printers, each vendor used its own computer codes for signalling the printer to underline or boldface text, and for specifying which dots to "fire" for high-resolution graphics. Since Epson's printers were the original hot sellers for the MS-DOS market (Epson manufactured the IBM Graphics Printer sold with the IBM PC) most software companies wrote their programs on the Epson dot-matrix printer standard. Similarly, word-processing software designed for solid-character printers used the Diablo 630 command standard. If your printer adheres to one of these standards, you'll find a plethora of software that's ready to run on your system.

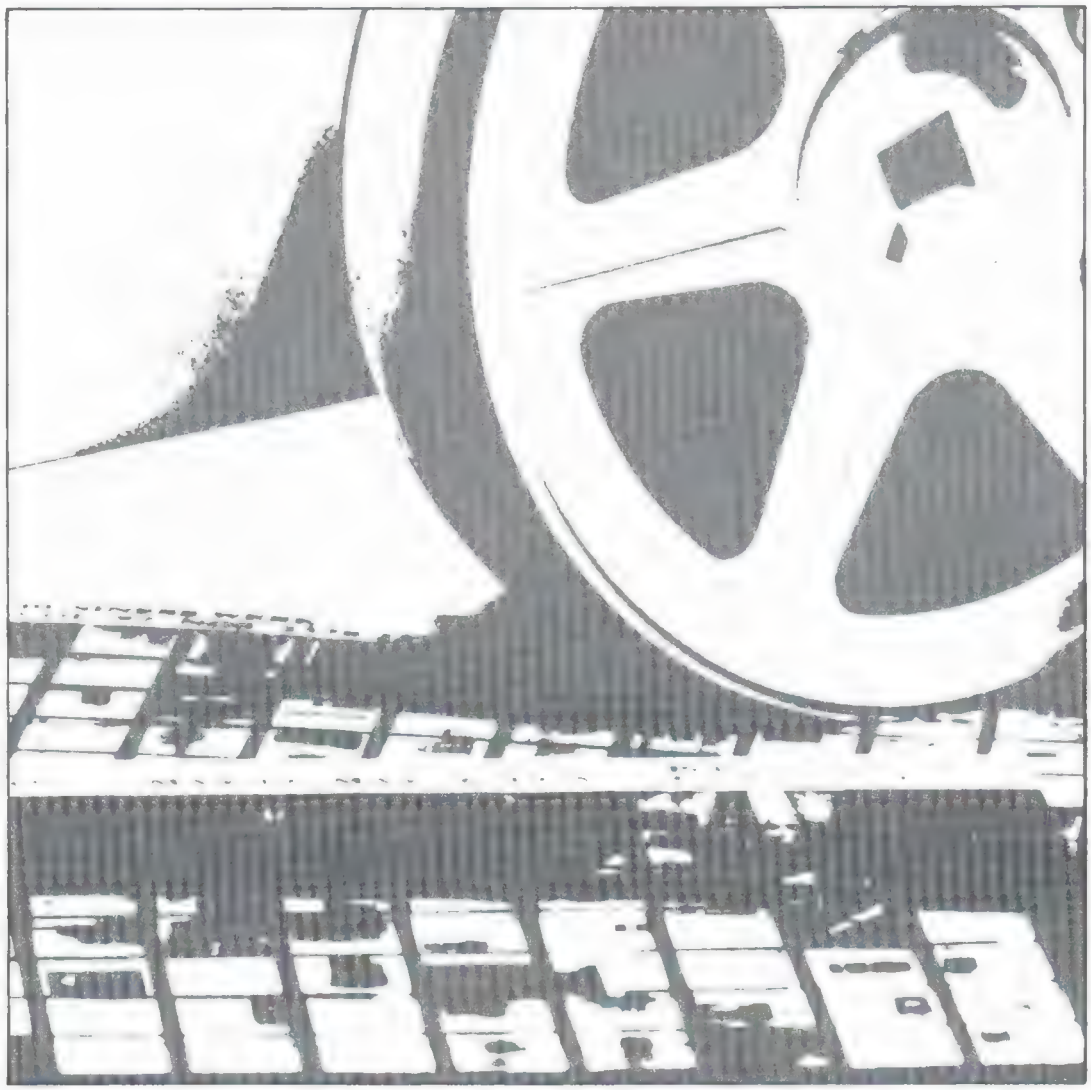
Once the basic printer technology question is settled, there are a myriad of other choices. Is battery power desirable? If not, is it important that the printer be easy to carry? Does it need to be able to print mailing labels or use individual sheets of paper?

Even if you own a portable computer, you may not need or want to run a printer in truly portable surroundings: in airports, in a car, overseas or in other locations without readily available 120-volt wall outlets. It may be sufficient to plug your printer in at the hotel room or at the client's office — or you may be able to leave the printer at home.

Assuming that you're interested in a battery-powered printer, you'll find that the selection is limited to several offerings from only a few vendors, compared to the wealth of AC-powered printer manufacturers. The truly portable printers are smaller and lighter than AC-powered units, but tend to be slower.

PHOTOGRAPH BY BENJAMIN MAGRO

This Publication is available in Microform.



Please send additional information for _____
(name of publication)

Name _____

Institution _____

Street _____

City _____

State _____ Zip _____

University Microfilms International

300 North Zeeb Road, Dept. P.R., Ann Arbor, Mi. 48106

Ink-jet technology is popular here, with the Hewlett-Packard ThinkJet and the new Epson HS-80. Thermal dot-matrix printers abound: the TTXpress sold by Purple Computing, the Epson P-80X, the Tandy/Radio Shack TRP-100, the Star Micronix STX-80 and the Axonix ThinPrint. Prices range from under $100 to over $500, with the principle differences being printer speed, battery life, type of paper used and vendor support.

One vendor, Axonix, even offers a solid-character, letter-quality battery printer: the ThinType.

If your needs will be satisfied by a desktop printer, the selection of models and features is immense — too large to be listed with this article. Be sure, however, to buy from a reputable manufacturer and dealer, and to choose a model that adheres to the industry standards.

Printers are often purchased to meet one particular need — such as printing business correspondence — and then are pressed into service in other ways. Printing mailing labels is a common example.

Let's take a look at the three types of computer paper. The first is the common individual cut sheet. To use cut-sheet paper, like embossed letterhead, your printer will need a *friction feed* mode. With friction feed, you load the printer just like a typewriter, rolling the paper around a rubber platen and under a metal paper bail. Friction-fed-only printers are fine for low-volume applications, such as correspondence, but are useless for printing many pages, unless an expensive cut-sheet feeder is purchased. Unfortunately, these cut-sheet feeders are only available for the more expensive desktop printers.

> Picking a printer for your portable shouldn't be a difficult process.

The second type of computer paper is roll paper, usually only used by telex machines and thermal printers. This paper is usually unsuitable for business applications, but can be the least expensive option for producing many internal documents or read-and-discard drafts or program listings.

The most common computer paper is called *continuous form* or *fanfolded* paper. With continuous paper, the individual sheets are joined at the top and bottom. The paper is fed into the printer through the *tractor feed holes*, or *carrier*, at the left and right. On high-quality computer paper the carriers are removable, leaving a clean sheet of paper. Continuous form paper is available as blank white bond, pre-printed letterhead, checks, or mailing labels.

To use continuous paper, a printer must be equipped with the tractor feed mechanism. Many printers accept both individual cut sheet and continuous form paper. Something to watch out for: On some inexpensive printers, the pins for feeding continuous form paper are fixed for 9.5-inch wide paper (that's standard 8.5-inch paper with two half-inch carriers). With these printers, it's next to impossible to print mailing labels or checks, since these forms tend to

portable 100

Portable 100 is a member of the International Data Group, the world's largest publisher of computer-related information. The group publishes more than 80 computer publications in more than 28 countries. Fourteen million people read one or more of the group's publications each month. Members of the IDG group contribute to the *CW International News Service*, offering the latest domestic and international computer news.

Members of the group include: ARGENTINA's *Computerworld Argentina, PC Mundo;* ASIA's *Asian Computerworld;* AUSTRALIA's *Computerworld Australia, Communications World, Australian PC World, Australian Macworld;* AUSTRIA's *Computerwelt Osterreich;* BRAZIL's *DataNews, PC Mundo, Micro Mundo;* CHILE's *Informatica, Computacion Personal;* DENMARK's *Computerworld Danmark, PC World Danmark;* FINLAND's *Tietoviikko, Mikro;* FRANCE's *Le Monde Informatique, Distributique, InfoPC, PC Hebdo, LM Telecom;* GREECE's *Micro and Computer Age;* HUNGARY's *Computerworld/SZT, Mikrovilag, Tudomany;* INDIA's *Dataquest;* ISRAEL's *People & Computers Weekly, People & Computers Monthly;* ITALY's *Computerworld Italia;* JAPAN's *Computerworld Japan;* MEXICO's *Computerworld Mexico, Compumundo;* THE NETHERLANDS' *Computerworld Netherlands, PC World Netherlands;* NEW ZEALAND's *Computerworld New Zealand;* NORWAY's *Computerworld Norge, PC World Norge;* PEOPLE'S REPUBLIC OF CHINA's *China Computerworld, China Computerworld Monthly;* SAUDI ARABIA's *Arabian Computer News;* SOUTH KOREA's *Electronic Times/Computerworld, PC World;* SPAIN's *Computerworld Espana, Commodore World, PC World Espana, Communicaciones, Informatica Industria;* SWEDEN's *ComputerSweden, Mikrodatorn, PC Worlld;* SWITZERLAND's *Computerworld Schweiz;* UNITED KINGDOM's *Computer News, DEC Today, ICL Today, PC Business World, Lotus UK;* UNITED STATES' *AmigaWorld, Boston Computer News, CD-ROM Review, Computer × Software News (Lebhar-Friedman), Computer Currents, Computers in Science, Computerworld, Digital News, Federal Computer Week, 80 Micro, FOCUS Publications, InCider, InfoWorld, MacWorld, Network World, PC World, Portable Computer Review, Portable 100, Publish!, PC Resource, RUN;* VENEZUELA's *Computerworld Venezuela;* WEST GERMANY's *Computerwoche, PC Wellt, RUN, Information Management, PC Woche.*

Vendors of Battery-Powered Printers

Vendor	Model	Dot Matrix Print Type	Paper Width	Speed
Axonix 417 Wakara Way Salt Lake City, UT 84108 (800) 821-7093 *Circle No. 101*	ThinWrite 80 ThinWrite 100	Impact Impact	10 in 10 in	50 CPS 100 CPS
Hewlett-Packard 11000 Wolfe Road Cupertino, CA 95014 (800) 367-4772 *Circle No. 102*	Think-Jet	Ink Jet	8.5 in	150 CPS
Tandy/Radio Shack 300 One Tandy Center Fort Worth, TX 76102 *Circle No. 103*	TRP- 100 TP-10	Thermal Thermal	8.5 in 4.2 in	50 CPS 30 CPS
Epson America 26300 Telo St. Torrance, CA 90505 (213) 534-4500 *Circle No. 104*	HS-80	Ink Jet	10 in	160 CPS
Purple Computing 420 Constitution Ave. Camarillo, CA 93010 (800) 732-5012 *Circle No. 105*	TTXpress	Thermal	8.5 in	50 CPS
Star Micronix Components Division 70-D Ethel Road West Piscataway, NJ 08854 (201) 572-9512 *Circle No. 106*	STX-80	Thermal	8.5 in	60 CPS
Ergo Systems 303-3 Convention Way Redwood City, CA 94063 (415) 322-3746 *Circle No. 107*	Hush-80	Thermal	8.5 in	80 CPS

be narrower than 9.5 inches. If possible, select a tractor-fed printer that can adjust for forms between 9.5 inches (standard paper) and 4.25 inches (standard mailing labels).

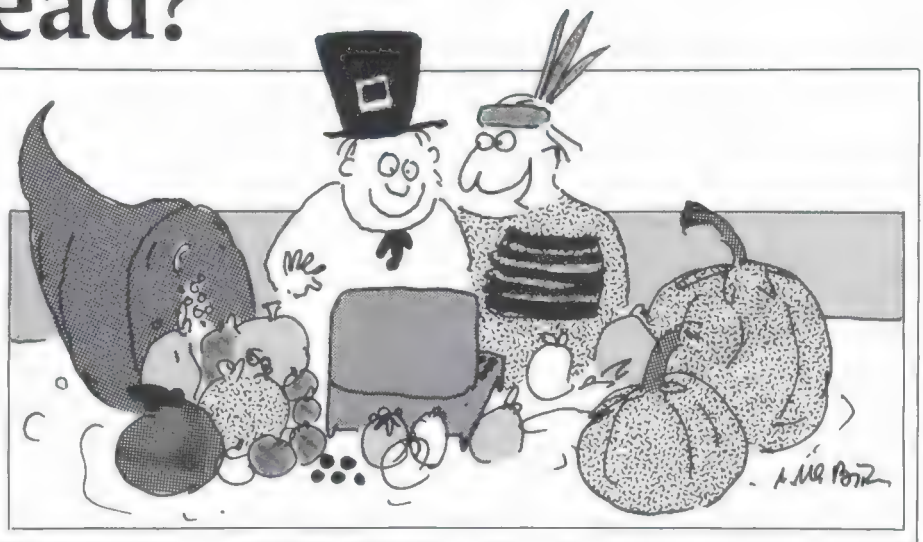
Many expensive printers are factory-equipped for friction-feed paper only, with an optional tractor feed unit costing between several hundred and several thousand dollars. Be sure to figure this cost into the price of the printer.

Purchasing a printer for your portable shouldn't be a difficult process. Ask yourself some easy yes-no questions:

- Does the printer need to be battery powered?
- Do I need solid-character letter quality, or will dot-matrix suffice?
- Will I be printing correspondence only, or will my needs vary?
- Do I need two printers: One high-quality desktop unit for the office, and an inexpensive dot-matrix for "on the road"?

Once those decisions are made, the selection is easy. Pick a printer with the highest speed and best quality output that your budget can allow.□

Who's the Blockhead?



When someone says *bit-mapped* to me, I think of graphics. Take the Model 100 or Tandy 102 liquid-crystal display (LCD), for example. In its normal, TEXT-like mode, the LCD is in character-mapped mode. That means that there are 320 addressable positions (eight by 40), each of which can contain any of 256 possible characters (the ASCII codes). The Tandy 200 has twice as many — 640 addressable positions (16 by 40). You can't do much graphics with only 320 or even 640 addressable positions.

But switch to bit-mapped mode — that's where graphics can do its magic. Why bit-mapped? The LCD is divided into many small addressable positions, each of which has only two possible characters: A black dot or a white dot. A two-state situation can be represented in one binary digit (one or zero), and since *bit* is a contraction of *b*inary digi*t*, we end up with bit mapping. There's another word used to describe an addressable position in a bit-mapped setting, by the way: *pixel*, for picture element.

The Model 100's bit-mapped mode offers 12,800 pixels, 64 vertically by 200 horizontally. The Tandy 200 again has twice the capacity, 25,600 pixels, 128 by 200. Ah, now we're getting to some real graphics potential.

THE WINNING DRAWING

The Tandy laptops offer a few BASIC-language statements for creating simple bit-mapped graphics. PSET sets, or turns black, any pixel. PRESET resets, or whitens, a pixel. LINE draws black or white lines between any two pixels, or optionally produces a solid or outline box between any two pixels.

Let's try some of these statements by drawing a happy blockhead up at the left-hand corner of our display. From the Main Menu, select BASIC. Then type in these statements:

```
10 CLS
```

This clears the Model 100 or Tandy 200 screen to all white pixels.

```
20 LINE (0,0)-(49,49),1,BF
```

The laptop graphics statements work on a modified Cartesian *x-y* coordinate system. Each pixel is referenced by two numbers. The first is the horizontal *x* coordinate, which ranges from 0 (left-most pixel) to 319 (right-most). The second number is the vertical *y* coordinate, but reversed from the school-book norm, ranging from 0 (top-most pixel) to 63 (bottom-most).

The LINE command needs two pixels (since a line is determined by two points). The argument *1* indicates the color black; the argument *BF* stands for *box, filled*. This statement will result in a black solid square extending from the top-left corner of the LCD to a point 50 pixels right and 50 pixels down.

```
30 LINE (10,10)-(39,39),0,B
```

This LINE statement draws a plain, or outline, box. The color code, *0*, indicates that this box will consist of white pixels. This will be the outline of the happy blockhead's face.

```
40 PRESET (20,20)
```

The left eye is produced by this PRESET statement. PRESET produces individual white pixels, in this case 21 pixels right and 21 pixels down from the top-left corner of the LCD.

```
50 PRESET (29,20)
```

Here's the right eye, 30 pixels right and 21 pixels down. We're using 29 instead of *30* as a horizontal coordinate to maintain a left-right symmetry.

```
60 LINE (15,30)-(20,35),0
```

Time for the award-winning smile; this short line segment, drawn in color *0*, or white, takes care of the left part of the blockhead's grin. Note that there's no final argument after the color code; if there's no *B* or *BF*, the default is a simple line segment.

```
70 LINE (34,30)-(29,35),0
```

This statement produces the mirror-image of line 60.

```
80 LINE (20,35)-(29,35),0
```

And, finally, the bottom line of the blockhead's smile.

```
90 IF INKEY$ = "" THEN 90 ELSE
   MENU
```

Since we don't want any text like BASIC's *Ok* prompt on our display, let's keep the happy blockhead locked on the screen until we've impressed all of our friends. This statement waits for a key to be pressed, using the built-in function INKEY$, and returns to the Main Menu.

KEEPING IT CLEAN

Bit-mapped graphics have many potentials for Model 100-family owners, in recreation, business graphics, and statistical analysis. We've examined several applications in past issues, and we'll be exploring more in the future, including a simple general-purpose LCD function plotter.

Next month in MAXRAM, we'll see how to create a happy roundhead as a refinement of our happy blockhead. Lock the doors, Ma, here comes trig!

—Alan L. Zeichick

6 ROM BANK

plus powerful Nicad battery pack that gives 30 hours of power to your Model 100

A joint PCSG/CRYPTRONICS project.

Now you can access LUCID, DISK+, WRITE ROM, RAM+ and others instantly.

The 6 ROM BANK plus battery pack lets you have the ultimate Model 100 system. When you get your unit just press in up to 6 ROMS into the sockets then push in a simple plug into your Model 100's ROM socket. The ROM bank has two posts on either end that insert into the two little holes on the underside of your Model 100.

The ROM bank props up the Model 100 at the same angle and height as those little legs you've seen. The ROM BANK itself is only about 1½" deep and it runs the width of your Model 100. It only weighs one pound. It not only installs instantly, but it pops free in a second if you need everything to lie flat in a briefcase.

Change from ROM to ROM with the touch of a thumb switch.

You can go from LUCID to WRITE to DISK+ to any other ROMS just by turning the thumb switch at the side of the ROM bank. The 6 ROM BANK is a sturdy well built construction that looks like it is a part of your Model 100.

What is also fantastic is that the ROM bank has a powerful NICAD battery and recharger built right in. This power source supplies up to 30 hours of life to your Model 100 with just 6 hours of recharge. What's nice is that it recharges right from your Model 100's power adapter. This is a quick charge system and if you need power in a hurry, you can get 6 hours of life for your Model 100 by just charging for an hour and half.

Suddenly, the Model 100 is a very powerful computer.

If you have the HOLMES portable disk drive with its powerful bundled database software package or the CRYPTRONICS 128K RAM expansion along with LUCID, WRITE ROM and DISK+ in the 6 ROM bank with its rapid rechargable NICAD power source, you have the ultimate portable system. It's all available only from PCSG.

As usual we don't want you to take our word for it. The 6 ROM BANK is sold on a 30 day trial. If you are not satisfied simply return within thirty days for a full refund. MC, VISA, AM. EX. or C.O.D.

1-214-351-0564

PORTABLE COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. No. 207, Dallas, Tx. 75229

VISA / MASTER CARD / AM. EXP. / C.O.D.

Circle 75 on Reader Service Card

Ever Dream of a Faster Modem, Longer Battery Life, and All the RAM Memory and ROM Software you want?

Wake Up! BOOSTER PAK is Here!

Traveling Software introduces the BOOSTER PAK! An incredible breakthrough for Tandy Model 100/102 laptop computers. The BOOSTER PAK gives you an unprecedented 2 megabytes of RAM memory and ROM software. At a very affordable price.

Flexible Design

The BOOSTER PAK is designed to meet your needs now and in the future. You can customize it as you go.

Easy Installation

Just snap the BOOSTER PAK onto the bottom of your Tandy 100/102. Plug in two cables and you're in business.

Built-in Software

Equally as incredible as the hardware is the built-in BOOSTER PAK software. Our unique virtual RAM disk software eliminates any need to do "bank switching." File subdirectories are supported for easy organization of your data. BASIC programs can access files as large as your RAM memory—up to two megabytes! We have also included our popular TS-DOS disk operating system for use with the Tandy disk drive and our new Desk-Link software, as well as an XMODEM program to upload/download files up to 2 megabytes directly to the virtual RAM disk. And to top it off, we have even included a fast action Asteroids game with amazing graphics in our standard BOOSTER PAK.

The BOOSTER PAK Everything You Asked For and More!

F E A T U R E S

Here's what you get in a standard BOOSTER PAK for only $429:

- 128K of RAM memory (96K available for files)
- 64K of ROM software
- 16 socketed slots for 32K RAM and/or ROM software chips
- 2 Tandy Molex ROM sockets
- Virtual RAM software (no bank switching or copying)
- File folders/sub-directories supported
- TS-DOS disk software built-in
- XMODEM file upload/downloading to virtual RAM
- Long-life lithium battery for RAM backup (rated at 7 years)
- BASIC programming access to virtual RAM
- ROM environment software (mix and match any ROM software)
- Ability to develop ROM software from 32-480K in size
- Fast action Asteroids game (with great graphics) built-in

BOOSTER PAK Options

- 32K RAM (certified low power) chips ($20 ea.)
- 6 slot RAM expansion board ($68)
- 256K RAM expansion modules (requires expansion board) ($159 ea.)
- Internal rechargeable nicad battery pak ($79)
- Internal 1200 baud Hayes-compatible modem ($199)
- IBM Desk-Link software (requires a serial cable) ($39.95)
- Desk-Link null modem serial cable ($19.95)
- Sardine Plus word processing and spelling checker ($199.95) Four chip set includes complete Random House dictionary

Booster Pak™

To order ***BOOSTER PAK*** *call toll free*

1 800 343-8080

Or write: **Traveling Software**

TRAVELING SOFTWARE

North Creek Corporate Center
19310 North Creek Parkway
Bothell Washington 98011
206-483-8088

Traveling Software and the Traveling Software suitcase logo are regis-

What do you call thousands of words packed into one powerful chip?

The first electronic pocket dictionary for laptop computers.

If you have a laptop computer and you don't have **Sardine**, you're missing out on one of the most powerful laptop tools available today.

It's **Sardine**. The *first* laptop pocket dictionary. The *first* laptop spelling checker. The *first* to be put on a plug-in ROM chip. And the *first* to give you access to 33,000 words from what has been called "the best vestpocket dictionary in the world"—the Random House American dictionary. *(You even get your own printed copy of the dictionary with every* ***Sardine*** *you buy).*

Faster than a desktop!

With **Sardine** and virtually any word processing software, you can look up a single word in seconds or check an entire document up to 25K in size in less than three minutes. All you do is press two keys while you're typing and you can check just the word you're working on or your entire document.

Random House and Wang Labs quality.

Sardine gives you so much more because it gives your laptop computer capabilities you may never have imagined. In addition to the 33,000 word Random House™ American dictionary, over *7,000* of the most frequently used business words are included in the ROM version. These priority words are the results of a two-year, one million word study of business correspondence conducted by Wang Laboratories' lexicographers.

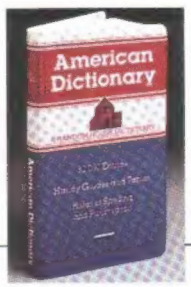
And that's not all. You can also word process with **Sardine**, because it contains the acclaimed T-word word processing program.

Able to create custom dictionaries with a single key.

Just press one key and **Sardine** lets you create an auxiliary, custom dictionary to which you can add words, names, abbreviations or any special terms you use. Add hundreds, even thousands of words, depending on available memory.

F E A T U R E S

Sardine is available for the Tandy Models 100/102, 200, and NEC PC-8201 laptop computers.
Requirements: 16K RAM, Tandy/Purple Computing disk drive optional for ROM version.



- **Sardine** is available on both a 3½ inch disk and a plug-in ROM chip.
- Super fast! Processes over 13,000 dictionary words a minute.
- Look up a single word in seconds. Or, check an entire document up to 25K in less than three minutes. Corrections are automatically inserted.
- ROM version contains the acclaimed T-word word processing program and over 7,000 "priority" words on the ROM chip itself. (ROM version also works with the disk).
- Create your own auxiliary dictionary for special terminology.

P R I C I N G

3½" Disk version $99.95
Plug-in ROM version $169.95
(includes T-Word word processing)

To order ***Sardine*** *call toll free:*

1 800 343-8080

Or write: **Traveling Software**
North Creek Corporate Center
19310 North Creek Parkway
Bothell, Washington 98011
206-483-8088

Circle 77 on Reader Service Card

SARDINE

TRAVELING SOFTWARE®

Random House and the Random House logo are registered trademarks of Random House Inc.

SUPER ROM

Lucid Spreadsheet Write ROM Database Outliner

NOW YOU CAN REALLY HAVE IT ALL!

All on one ROM. Truly the finest four programs available for the Model 100 — guaranteed. Try it for 30 days. If you aren't blown away by the excellence return it for a full refund.

$199.95

The four best programs for the Model 100 all on one ROM. 32K of power without using any RAM for program storage. This is the PCSG Snap-In ROM that just presses easily into the little ROM socket in the compartment on the back. You access the four right from the main menu like built-ins.

Write ROM — the definitive word processor for the Model 100. Function key formatting or dot commands. Search and replace. Library feature — inserts words, phrases or whole documents into text from just a code. MAP lets you see a picture of your document. In all there are 60 features and functions. No one can claim faster operation. FORM lets you create interactive forms with on-screen prompts that you can answer from the keyboard. Nothing else for the Model 100 compares with the features of Write ROM. Exactly the same as the Write ROM sold as a single program. Infoworld says it "makes the Model 100 a viable writing unit . . . surpassed our highest expectations for quality and clarity."

Lucid Spreadsheet: This is the one PICO magazine says "blows Multiplan right out of the socket" and Infoworld performance rated as "excellent" and said "makes the Model 100 compute." Gives you features you cannot get with Lotus 123. Lets you build spreadsheets in your Model 100 that would consume 140-150K on a desktop. Program generating capability with no programming knowledge required. Variable column widths. Includes find and sort with function key control. It's fast, recalculates like lightning. No feature has been taken from the original, only new ones added.

Database: This is a relational data base like no other. You can do everything from mailing lists to invoices. No complicated pseudo-coding, you create input screens as simply as typing into TEXT. You are not limited by size; you can have as large an input screen as you wish. Prints out reports or forms, getting information from as many files as you like. Complete math between fields. Total interface with Lucid worksheets.

Outliner: Does everything that Thinktank does on a PC but a whole lot better. Includes a Sort for your headlines. Lets you have headlines of up to 240 characters. Has cloning, hoisting and sideways scroll up to 250 characters. Like Lucid, this one sets a new standard for outliners. This is the way to plan and organize your projects.

Present Lucid and Write ROM owners can upgrade for $100. If you have both it's $75.

As usual PCSG sells the Super ROM on a thirty day guarantee. If for any reason you are not satisfied, simply return it for a full refund.

We are excited about this product. Super ROM gives the Model 100 the true power of a desktop. No other multi-program ROM has software that compares. But don't take our word for it. We invite you to make that comparison yourself. Priced at $199.95 on Snap-In ROM.

Got stuck with somebody else's multi-ROM? We'll upgrade it for $100.

(214) 351-0564

PORTABLE COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd., #206, Dallas, TX 75229

MC, Visa, American Express, Check, or C.O.D.

© PCSG